ESSAYS ON THE HARMONIZATION OF THE CORPORATE TAX SYSTEM IN EUROPE

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2015

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Dissertation submitted to the Faculty of Economics and Business Administration, Ghent University, in fulfilment of the requirements for the degree of Doctor in Applied Economic Sciences.

PhD Series – Ghent University, September 2015
Faculty of Economics and Business Administration
http://www.feb.ugent.be

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ACKNOWLEDGEMENTS / DANKWOORD

Dit doctoraat behalen vergde heel wat doorzettingsvermogen. Ik ben dan ook ontzettend opgelucht nu ik het voorwoord kan neerschrijven. Opgelucht en dankbaar omdat ik er niet alleen voor stond. Ik neem daarom graag even de tijd om een aantal mensen te bedanken.

Dit doctoraat was niet mogelijk geweest zonder mijn promotor Prof. dr. Philippe Van Cauwenberge. Philippe, ik herinner met het moment waarop je me vroeg om in de academische wereld te stappen. Ik moet eerlijk bekennen dat dit niet mijn eerste carrièrekeuze was geweest, maar ik moet je bedanken voor jouw overtuigingskracht want vandaag kan ik zeggen dat ik mijn job met veel plezier doe. Mijn papers werden door jou keer op keer heel nauwkeurig en met een kritische blik nagelezen, jouw bedenkingen en waardevolle feedback kwamen mijn werk alleen maar ten goede. Als promotor stond je steeds voor me klaar maar liet je me voldoende vrijheid om mijn eigen keuzes te maken, hetgeen ik ten zeerste apprecieer.

Veel heb ik ook te danken aan mijn promotor binnen Hogeschool Gent, Carine Coppens. Carine, had jij geen toekomst gezien in CCCTB, dan had ik hier nu niet gestaan. Je bruist van energie en jouw goede ideeën komen steeds opnieuw opborrelen. Niets is voor jou te lastig of te veel en dit werkt bijzonder aanstekelijk. Je stimuleerde mij om mijn onderzoeksresultaten met de wereld te delen en te gaan spreken op verschillende congressen. Je gaf me de kans om me niet alleen als onderzoeker, maar ook als lector te ontwikkelen. Je geloofde vanaf dag één in mijn kunnen en dat gaf me een ton zelfvertrouwen. Mijn toekomst als lector bij Hogeschool Gent heb ik aan jou te danken. Dankjewel voor alles!

Further I would like to thank the members of my doctoral jury: Prof. dr. Em. Erik De Lembre, Prof. dr. Bertel De Groote, Prof. dr. Machteld Van den Bogaerd and Prof. dr. Christoph Spengel. Thank you all for your reflections and reviews during the pre-defense. They were very helpful! Also, I would like to thank the dean Prof. dr. Marc De Clercq and academic secretary, Prof. dr. Patrick Van Kenhove for taking part in the official closure of my doctorate.

Zonder de financiering van het Onderzoeksfonds Hogeschool Gent was dit onderzoek niet mogelijk geweest. Ik dank graag onze decaan, Anita Bernard, en ons diensthoofd onderzoeksaangelegenheden, Koen Rymenants, voor hun vertrouwen en steun tijdens dit project. Een speciale dankjewel aan Jan Schelstraete, die er vanaf het begin bij was, er steeds in geloofde en met veel plezier mijn werk nalas.

Daarnaast wil ik al mijn fantastische collega's bedanken voor de bemoedigende woorden in de wandelgangen en de fijne babbels. Mijn collega Annelies Roggeman wil ik in het bijzonder bedanken. Annelies, jij was mijn gids doorheen deze woelige reis. Ik mag gerust zeggen dat ik zonder jou verdwaald was geraakt in de wereld van onderzoek. Ik bewonder jouw doorzettings- en relativeringsvermogen. Ik werk ongelofelijk graag met jou samen, je bent gestructureerd, to the point en recht door zee. Ik kon me geen betere helft van de 'olijke tweeling' wensen. Dankjewel om er voor me te zijn, zowel tijdens als buiten het werk.

Mijn vrienden en familie wil ik bedanken voor de vele leuke momenten. Feestjes, etentjes, gezelschapsspellen spelen, reisjes, en ga zo maar verder: het waren keer op keer zeer welgekomen afwisselingen tijdens mijn doctoraat.

Mama en papa, jullie wil ik bedanken voor jullie eeuwige steun in alles was ik onderneem. Ik kreeg steeds alle kansen tot zelfontplooiing, waarvoor ik jullie niet genoeg kan bedanken.

En last but certainly not least wil ik mijn man, Evert, en onze dochter, Jona, bedanken. Liefje, jij hebt de eindmeet dichterbij gebracht door er altijd voor mij te zijn. Jouw kritische ingesteldheid en bewonderenswaardig perfectionisme dagen me steeds uit om het beter te doen. Ik houd van jouw zin voor avontuur die telkens mijn grenzen verlegt. Jij verrijkt elke dag opnieuw mijn wereld. Natuurlijk wil ik ook onze kleine lieve muis bedanken. Jona, voor jou heb ik gewoonweg geen woorden, dag in dag uit geef je mij alles wat ik nodig heb. Jij en je papa maken van mij de gelukkigste vrouw ter wereld!

Isabelle Verleyen,
September 2015

NEDERLANDSTALIGE SAMENVATTING

De huidige Europese vennootschapsbelastingsystemen zijn niet langer aangepast aan de geglobaliseerde economische activiteiten. Europese ondernemingen worden belast op nationaal niveau en dit leidt tot tal van fiscale belemmeringen voor ondernemingen die grensoverschrijdend actief zijn. Zo worden Europese multinationals geconfronteerd met hoge nalevingskosten ten gevolge van het naast elkaar bestaan van 28 verschillende nationale vennootschapsbelastingsystemen. Bovendien krijgen ze te maken met allerhande beperkingen omtrent grensoverschrijdende verliesverrekening en met hoog oplopende kosten ten gevolgen van de documentatie plicht betreffende interne verrekenprijzen.

De Europese Commissie (EC) gelooft dat een harmonisatie van de vennootschapsbelasting binnen Europa de enige allesomvattende oplossing is om de verschillende fiscale obstakels te elimineren. Daarom publiceerde de EC het voorstel voor een richtlijn van de Raad betreffende 'een gemeenschappelijke geconsolideerde heffingsgrondslag voor de vennootschapsbelasting' (EC, 2011). Het nieuwe Europese belastingsysteem is beter gekend onder de Engelse benaming 'the Common Consolidated Corporate Tax Base' of kortweg, de 'CCCTB'.

Het voorstel omvat een set fiscale regels die Europese ondernemingen toelaten een gemeenschappelijke geconsolideerde belastbare basis te berekenen op groepsniveau. Deze geconsolideerde basis wordt vervolgens herverdeeld over de verschillende groepsentiteiten op basis van een toewijzingsformule die arbeid, activa en omzet als drie gelijk gewogen factoren omvat. De lidstaten behouden het recht om hun belastingtarief toe te passen op het verkregen deel uit de gemeenschappelijke geconsolideerde basis.

Dit doctoraat draagt bij tot het eerder beperkt academisch onderzoek omtrent CCCTB. Hierbij wordt (i) het ontwerp van de toewijzingsformule in detail bestudeerd, (ii) het belang voor België, om immateriële vaste activa op te nemen in de verdeelsleutel, aangekaart, (iii) inzicht gegeven in het stemgedrag van de leden van het Europees Parlement inzake CCCTB.

De eerste studie focust op het design van de toewijzingsformule, deze speelt een belangrijke rol voor zowel de lidstaten, die hun belastinginkomsten wensen te beschermen, als de ondernemingen, die zo weinig mogelijk belastingen trachten te betalen. Meer specifiek

bestuderen we het effect van een wijziging in het aantal factoren en de gewichten toegekend aan deze factoren op de verdeling van de gemeenschappelijke basis. Het gebruik van niet gepubliceerde data van een Europese multinational, stelt ons in staat de factordefinities in detail te bestuderen. Onze simulaties tonen aan dat bij het opnemen van meerdere factoren en het toepassen van gelijkere gewichten de geconsolideerde basis gelijker wordt verdeeld, hetgeen de opportuniteiten voor taks planning doet afnemen. Bovendien wordt aangetoond dat, voor de multinational in onze studie, het toepassen van eenvoudige factordefinities slechts een gering effect heeft op de verdeling van de geconsolideerde basis.

De tweede studie focust op de factor 'activa' van de toewijzingsformule. De Commissie stelt namelijk voor om immateriële vaste activa slechts gedeeltelijk en tijdelijk op te nemen in deze factor. De hoofdreden hiervoor is het vermijden van taks planning die kan ontstaan door waarderings- en locatie issues bij immateriële vaste activa. Echter, het niet opnemen van immateriële vaste activa kan leiden tot een oneerlijke verdeling van de geconsolideerde basis. Lidstaten die investeren in een kenniseconomie zouden hierdoor worden benadeeld. Deze empirische studie onderzoekt, vanuit een Belgisch standpunt, het belang om immateriële vaste activa op te nemen in de toewijzingsformule. Meer concreet onderzoeken we de winstgenererende capaciteit van zowel de voorgestelde factoren, met name materiële vaste activa, omzet en arbeid, als de additionele factor, zijnde immateriële vaste activa. Onze resultaten tonen aan dat immateriële vaste activa, gedefinieerd als de som van de 'geactiveerde kosten voor onderzoek en ontwikkeling' en 'concessies, octrooien en licenties', een significante positieve impact hebben op de winstcreatie bij Belgische ondernemingen. We nemen De 'geactiveerde kosten voor O&O' eveneens als een aparte factor op en vinden hiervoor een significante en positieve bijdrage tot winst. Bovendien tonen onze resultaten aan dat beide formules, zowel deze inclusief immateriële vaste activa als deze inclusief geactiveerde kosten voor O&O, significant beter presteren dan de vooropgestelde formule.

Het voorstel tot een CCCTB richtlijn omvat een beslissing omtrent directe belastingen, hetgeen betekent dat de raadplegingsprocedure wordt gevolgd. Binnen deze procedure ligt de beslissingsmacht bij de Raad van de Europese Unie en vervult het Europese Parlement (EP) een raadgevende functie. In april 2012 keurde het EP de geamendeerde versie van het CCCTB voorstel goed (452 'ja' stemmen, 172 'neen' stemmen en 36 onthoudingen). *De derde*

studie bestudeert het stemgedrag van de leden van het EP (MEP) bij deze stemming. We focussen hierbij op de vraag of het stemgedrag al dan niet wordt beïnvloed door de economische impact van CCCTB. Economische impact wordt in eerste instantie gemeten door de impact van CCCTB op de belastinginkomsten van de verschillende lidstaten. Onze resultaten tonen aan dat hoe hoger de impact van CCCTB op de belastinginkomsten van een lidstaat, hoe waarschijnlijker dat een MEP het voorstel goedkeurt. Om onze resultaten kracht bij te zetten werd de economische impact van CCCTB eveneens gemeten door de impact van CCCTB op het BBP van en de werkgelegenheid binnen een lidstaat. De resultaten werden hierbij bevestigd, namelijk hoe hoger de impact op werkgelegenheid en BBP, hoe meer kans dat een MEP het voorstel gunstig stemt. Tot slot vinden we een significante invloed van politieke partij variabelen en laden variabelen op het stemgedrag van de MEP terwijl individuele karakteristieken hierop geen invloed hebben.

EXECUTIVE SUMMARY

The current rules for corporate taxation in Europe do not longer fit the globalized economic activities. Taxing corporate income on a national level leads to many tax obstacles for European multinationals. European multinationals, for example, face high compliance costs, suffer limitations to cross-border loss compensation and have to deal with transfer pricing issues.

In an attempt to provide a comprehensive solution for the underlying tax obstacles that currently harm the international competitiveness of European multinationals, the European Commission (EC) launched a proposal for a Common Consolidated Corporate Tax Base directive (EC, 2011). The proposal includes one set of tax rules, allowing multinationals to calculate a common consolidated corporate tax base on a group level. The consolidated tax base would then be reapportioned to the different group members by means of an apportionment formula, which includes the factors active, sales and labour. The Member States preserve the right to apply their own tax rate to their specific share of the consolidated tax base.

This dissertation contributes to the rather limited academic research concerning CCCTB. The core aims are (i) to explore the design of the European apportionment formula, (ii) to investigate the EU apportionment formula regarding the role of intangible assets in Belgium and (iii) to attain insights in the voting behaviour of the Members of the European Parliament (MEP).

In the *first study* we focus on the design of the European apportionment formula, which plays a major role in Member States' concern for protecting their tax revenue, as well as for the multinational companies' tax minimizing opportunities. More specifically, we investigate the effect of changing the number of factors that make up the formula and the weight given to each factor. We used unpublished firm level data from a listed multinational, which enabled us to study the factor definitions in detail. Our simulation results indicate that including more factors and applying more equal weights distributes the consolidated tax base more equally, which reduces tax planning opportunities. Moreover, for our multinational, using more simplified factors definitions does not change the allocation of the

consolidated tax base to a great extent. This advocates the inclusion of simplified factor definitions to reduce the compliance costs for multinationals.

In the *second study* we focus on the factor assets in the apportionment formula. Namely, it is the commission's intention to only partly and temporarily include intangible assets into this factor. The main reason for this is that the inclusion of intangibles could create tax planning opportunities for multinationals caused by location and valuation issues. However, excluding intangible assets from the apportionment formula could lead to an unfair distribution of the consolidated tax base. Member States that invest highly in a more knowledge-based economy, would lose taxable income they are entitled to. We empirically investigate this issue in a Belgian context. More precisely, using firm specific data from the Belfirst database, we investigate the profit generating capacity of both the proposed allocation factors, i.e. tangible fixed assets, sales and labour, as well as the additional allocation factor, viz intangible assets. Our results show that intangible assets, defined as the sum of 'capitalized R&D costs' and 'concessions, patents and licences', have a significant and positive impact on the creation of profit. We also include the factor capitalized R&D costs separately and find a positive and significant contribution of this factor to the generation of profit. In addition, our results show both the formula adding intangible assets to the proposed allocations factors, and the formula adding capitalized R&D costs, perform significantly better than the formula only including the proposed factors. Moreover, the formula adding intangible assets is more precise in explaining profit than the formula including capitalized R&D costs.

The proposal for a CCCTB directive concerns a decision about direct taxation, meaning that the consultation procedure is applied. This procedure implies that the final decision rests with the Council of the EU and that the European Parliament plays a consultative role. In April 2012, the Member of the European Parliament approved the amended CCCTB proposal (452 votes in favour, 172 against and 36 abstentions). The *third study* gives insight into the voting behaviour of MEPs concerning the CCCTB directive. We focus on the question whether or not the voting behaviour of MEPs is influenced by the economic impact of CCCTB for their country. The economic impact of CCCTB is measured through the impact of CCCTB for each MS on their corporate income tax revenue. We collected the voting results from the independent organization VoteWatch Europe. Our results show that a higher impact of CCCTB on the corporate income tax revenue, increases the likelihood of a MEP to vote in

favour of the proposal. As a robustness check we also measured economic impact by using the impact on employment and GDP. Again, we find that MEPs are significantly and positively influenced in their voting behaviour by the impact of CCCTB on employment and GDP for their country. Finally, we find that political party and country variables also have a significant effect on the voting behaviour of MEPs, whereas the individual characteristics of MEP did not have a significant influence.

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CHAPTER 1: GENERAL INTRODUCTION

1 The history of the development of a harmonized tax system in Europe

"Speaking from my experience as a person involved for a long time in building the European Union, it is important to have patience and efforts to build a community of nations."

-Giorgio Napolitano-

Patience and efforts are also key ingredients in the process towards a harmonized corporate tax system in Europe . The first studies concerning a limited degree of harmonization of the corporate tax system in Europe date from 1962 with the Neumark report and from 1970 with the van den Tempel report. In 1988, the EC presented a draft proposal for the harmonization of the tax base of European Member States (MS). It was, however, never published, due to the reluctance of most MS (EC, 2001a). In September 1998, the EU ministers of Finance discussed, among other things, the Code of Conduct for company taxation. Some suggested that further measures in this field of company taxations might be relevant and the European Commission (EC) was given the task of studying company taxation in the European Community (EC, 2001b). They found that the existence of 28 different tax systems creates some fundamental tax obstacles harming cross-border economic activities and affecting the competitiveness of European companies (EC, 2001b). One such obstacle relates to intra-group transactions, where companies are obliged to establish inter-company transactions in accordance with the arm's length principle, i.e. under the conditions which would result from comparable transactions and circumstances between independent enterprises (OECD, 2009). The calculations and justification of the arm's length price is a costly and burdensome issue. Another obstacle concerns the limitations on cross-border loss relief. As only a limited number of countries allow loss offset within a group, over-taxation can occur for companies engaged in cross-border activities. A

third obstacle results from conflicting taxing rights between MS, leading to problems of double taxation. To remove obstacles related to international juridical double taxation, double tax conventions (DTC) were brought into existence. However, the network of DTC does not offer a sufficient solution as it is designed to operate in a bilateral context instead of an integrated setting (Kemmeren, 2012). A final obstacle revolves around the need to comply with a multiplicity of different tax rules, resulting in considerable compliance costs for multinationals active in different MS.

The EC proposed two possible remedies to the tax obstacles, namely a number of targeted solutions which remove individual tax obstacles or one comprehensive solution addressing all underlying causes of the tax obstacles at once. The Commission believes that a Common Consolidated Corporate Tax Base (CCCTB) is the only comprehensive solution to remove all underlying tax obstacles at once (EC, 2001b). With this statement the first stone towards the CCCTB directive was laid.

In 2004, the Ministers of Finance mandated the EC to investigate the possibilities of a harmonized tax system in the EU. In the same year, the EC set up a CCCTB working group consisting of experts from tax administrations of all MS. The working group examined and discussed the technical modalities of a CCCTB (EC, 2004). The proposal for a council directive on a Common Consolidated Corporate Tax Base was eventually published on 16 March 2011 and is based on the working documents[1] of the CCCTB working group. Together with the proposal, the EC published a detailed impact assessment of CCCTB (EC, 2011a).

On 19 April 2012, the European Parliament (EP) voted on the EC's proposal for a CCCTB. Applying the simple majority, the proposal[2] was approved with 452 votes in favour, 172 against and 36 abstentions (Vote Watch Europe, 2012). However, the final decision on the adoption of a CCCTB rests with the Council of the European Union. In order to introduce the new tax system, the council has to give its unanimous approval.

[1] All documents of the CCCTB working group are published on the website of the EC, taxation and custom unions: http://ec.europa.eu/taxation_customs/taxation/company_tax/common_tax_base/index_en.htm.
[2] The text voted on in the EP contained several amendments to the initial proposal for a CCCTB published by the EC. (EP, 2012)

2 The main principles of the Common Consolidated Corporate Tax Base

The main principle of the CCCTB is that it provides European companies with a single set of tax rules and gives them the possibility to fill in one single tax return for their entire EU wide activities. In a nutshell, the CCCTB implies that each European company could use a common set of rules to calculate its individual taxable profit. These individual tax bases would then be summed up to the consolidated tax base for a group of companies. Thereafter, the consolidated tax base would be shared among the individual companies by means of an apportionment formula. Companies are taxed on their specific share of the common tax base at the tax rate applied in the MS they are resident in. In what follows, we go into more detail on some important characteristics of the CCCTB.

2.1 Scope and optionality

In order to qualify for the new tax system, i.e. to be an eligible company, a company should (a) have a qualifying form and (b) be subject to corporate taxes (EC, 2011a, Art. 2). Qualifying forms and justified corporate taxes are listed in Annex I and Annex II of the proposal.

All European companies, irrespective of size, would be able to apply CCCTB. Moreover, not only groups of companies, but also stand-alone companies (entities that are not part of a group) would be able to apply the common tax rules. In this way, the Commission aims to facilitate the step towards cross-border economic activities.

Since CCCTB is primarily designed to facilitate cross-border economic activities for European multinationals, the EC will not force companies that have no cross-border activities into the new tax system. Therefore, the proposal concerns an optional system. In other words, the new tax system would exist together with the national corporate tax systems, leaving companies the freedom to choose between both. However, the optionality includes an 'all-in or all-out' treatment, meaning that if a company opts for the new tax system, all eligible members of the same group should apply the common tax rules (EC, 2011a, Art. 104). As the optional character of CCCTB would introduce tax planning opportunities, the EC has decided that once a group opts for CCCTB, it has to apply CCCTB for at least five successive tax years (EC, 2011a, Art. 105). The Commission adds that MS are free to make CCCTB compulsory legislation (EC, 2011a; De Vos, 2012).

The formation of a group is outlined in Article 55 of the proposal. Namely, a resident tax payer shall form a group with all its EU permanent establishments, all its permanent establishments located in another MS of its qualifying subsidiaries resident in a third country, all its qualifying EU subsidiaries and all its EU associations. A non-resident tax payer forms a group of all its EU permanent establishments and all its EU qualifying subsidiaries. Qualifying subsidiaries should be determined based on both ownership and control thresholds. Namely, a subsidiary qualifies if the parent company holds (a) more than 50% of the voting rights and (b) more than 75% of the company's capital or profit entitlements rights (EC, 2001, Art. 54 and Art. 55).

2.2 The corporate tax base of a group member

Following the proposal, the tax base of a group member would be determined by applying three steps.

In a *first step*, each group member calculates its individual tax base according to the same set of rules which are included in the proposal. Whereas the Belgian tax system starts from the book profits to determine the taxable basis, the individual tax base under CCCTB is defined as revenues less exempt revenues, deductible expenses and other deductible items[3] (EC, 2011a, Art. 10). Revenues are broadly defined in Article 4 of the proposal. For example, gifts received are explicitly described as revenue. In principle all revenues are taxable, unless they are defined as exempt in Article 11. This article specifies five categories of exempt revenue: (1) subsidies directly linked to the acquisition, construction or improvement of fixed assets, (2) proceeds from the disposal of pooled assets, (3) received profit distributions, (4) proceeds from a disposal of shares, (5) income of a permanent establishment in a third country. Deductible expenses include all costs made for obtaining or securing income (EC, 2011a, Art. 12). The proposal includes a limitative list of non-deductible expenses among which bribes, corporate tax and 50% of entertainment costs (EC, 2011a, Art. 14). Costs made for research and development can be immediately expensed for 100%. This policy fits in with the Commission's aim to stimulate R&D in Europe (De Vos, 2012).

[3] The proposal follows the realization principle, profits and losses shall be recognized only when realized. (EC, 2011a, Art. 9)

An essential element to the concept of CCCTB is that of consolidation, the *second step* in calculating a group member's tax base. The applied technique would be 'full consolidation', irrespective of the degree of control one company has in another. In calculating the consolidated tax base, intra-group transactions are completely ignored, which removes the need to establish inter-company transactions in accordance with the arm's length prices (EC, 2011a, Art. 59). Moreover, cross border loss compensation automatically results from the consolidation aspect. Should the consolidated tax base be negative, the loss will be carried forward (unlimited in time) and be set off against future positive consolidated tax bases (EC, 2011a, Art. 58). When the consolidated tax base is positive, it should be reallocated to the group members by means of the apportionment formula.

The *third step* in the CCCTB concept is the most controversial one, namely the redistribution of the consolidated tax base by means of formula apportionment[4]. With this step it is decided which part of the consolidated tax base is allocated to which group member and by consequence to which MS. Tax revenue implications for members states and tax liability implications for firms will therefore highly depend on the allocation mechanism. Formula apportionment does not have the intention to allocate income to its source perfectly but it allocates income by reference to factors that are deemed to reflect the income generating activities of a company (Hellerstein, 2005). Thus, the MS with larger shares of a group's income generating factors, will get larger shares of that group's consolidated tax base (EC, 2007a). The commission searched an apportionment formula (AF) that is enforceable, simple and cost effective but also difficult to manipulate and that results in a fair distribution of the consolidated tax base (EC, 2007b). Based on these thoughts, the proposed AF includes three equally weighted company specific factors, viz 'assets', 'sales' and 'labour'. The 'assets' factor is composed of tangible assets and only for a small amount of intangible assets. This raised a lot of controversies as it could lead to unfair results for MS investing in knowledge-based economies. The 'sales' factor includes the proceeds of all sales of goods and services. The commission suggests using a 'sales by destination', meaning that the sales will be included into the sales factor of the entity that is located in the MS where the goods are delivered or the service is offered (EC, 2011a). This use of a destinations based sales principle is to reflect the contribution of demand to profit generation, whereas the

[4] This apportionment formula method was chosen above a macro-based apportionment and a value added approach. For more detail on both approaches see EC, 2007.

contribution of supply is reflected in the factors of assets and labour. Moreover, in comparison with a 'sales by origin' principle, 'sales by destination' reduces the tax planning opportunities (EC, 2007b). The factor 'labour' combines the cost of employees and the numbers of employees in order to restrict the shortcomings of including either costs or number of employees.

It is important to mention that the CCCTB proposal does not include a harmonized tax rate. After the relocations of the consolidated tax base (step 3), the MS where the entity is located decides which tax rate is applied. Thus, the Commission wants to encourage a fair competition on tax rates (EC, 2011a).

2.3 Procedures

The proposal for a CCCTB introduces the principle of the 'one stop shop', meaning that a group of companies would have to deal with only one tax administration. The latter is called the principal tax authority, which should be the tax authority of the MS in which the parent company, i.e. the principal tax payer, is resident for tax purposes. Moreover, the group should file only one single consolidated tax return for their entire EU wide activities. The single tax return would be filed through the principal tax payer with the principal tax authority (EC, 2011a, Art. 109).

3 Overview of the dissertation papers

This dissertation consists of three studies concerning some major issues about the proposed CCCTB. In this part, we will describe the topic, methodology, main findings and contribution of each study.

3.1 The European apportionment formula: insights from a business case

Principal topic

A controversial issue in the CCCTB system is the reapportionment system, i.e. the apportionment formula. The need for such a system results from consolidating the individual tax bases. Consolidation brings with it the main benefits of CCCTB like the automatic loss

offset between group members or the exclusion of intra-group transactions. The system of formula apportionment is well-known in the US and Canada, where it was introduced in 1967 (Anand and Sansing, 2000). Based on the US and Canadian experiences, the EC proposed a formula including three firm specific factors, viz assets, labour and sales. These factors account for both the demand and supply side of the generation of income (EC, 2011a). The main focus of this study lies on the design of the apportionment formula, which plays an role in MS' concern for protecting their tax revenue, as well as for the multinational companies' tax minimizing possibilities. More specifically, we investigate the effects of the number of factors included and the weights given to each factor. We also study how the design is related to the intention to shift factors and what the effect is of using more simplified factor definitions than the ones proposed.

Data and methodology

To study the effects of several designs of the apportionment formula, we collected firm level data from a listed multinational that conducts its core activities at its Belgian headquarters. The multinational has entities in 11 European and 4 non-European countries. We were able to collect the necessary data to determine the allocation factors: assets, labour and sales by destination as defined in the proposal. We evaluated the effects of different formulas using the simulations technique. To do this, we formed two sets of formulas: factor formulas and weight formulas. The former change the numbers of factors included in the formula, whilst the latter vary the weights given to each factor. The different formulas result in different shares of the consolidated tax base allocated to a specific group member, i.e. the 'entity share' (ES). Multiplying the entity's share of the common tax base with the corporate tax rate applied in its country results in the 'entity percentage payable' (EPP). Adding the EPP of all group members results in the global corporate tax rate for the group (GCTR).

Findings

Our results show that including a larger number of factors and using more equal weights would lead to a more equal distribution which in turn would decrease the company's incentive to shift factors from high to low corporate tax countries. These results indicate that in order to create a formula that does not cause any behavioural distortions, more factors should be included and more equal weights should be applied. The results further indicate

that using more simplified factor definitions than proposed, does not lead to big changes in the allocation of the consolidated tax base. This could imply that there is no need to introduce complex factor definitions. However, one should be careful in simplifying the sales by destination factor. Simplifying this factor could transform the sales factor from a destination based allocation factor to a more origin based factor. Therefore, we recommend the Commission to provide European multinationals with a software tool enabling them to apply the sales by destination factors as prescribed without great efforts.

Academic contribution

Previous literature concerning the possible introduction of an apportionment formula focuses on the macro-economic effects only (see for example Devereux and Loretz, 2008; Runkel and Schjelderup, 2011; Bettendorf et al. 2010). A drawback of the existing literature is the lack of confidential firm data. This study is based on detailed firm level data of a company active in 11 different European countries. The availability of unpublished data, such as the tax returns, enables us to study the proposed factor definitions in detail. For example, we were able to apply the sales by destination factor including the spread throwback rule for nowhere sales, whereas previous research always had to rely on the sales by origin factor.

3.2 The European apportionment formula: the role of intangibles in Belgium

Principal topic

This paper contributes to the on-going debate on the inclusion of intangible capital in the European apportionment formula by focussing on the profit generating capacity of intangible assets for Belgian firms. As revenue implications for MS will highly depend on the allocation mechanism, the apportionment formula is, and has been, a controversial issue in the CCCTB history. It is the Commission's intention to only partly and temporarily include the previously incurred costs for R&D, marketing and advertising in the asset factor of a new group member. However, the current evolution towards a more knowledge-based economy makes intangible assets increasingly important as part of companies' total assets. Ignoring intangible assets could lead to an unfair distribution of the CTB among the MS. Especially for

MS that invest highly in a more knowledge-based economy, excluding intangible assets from the EU apportionment formula could lead to huge losses in terms of corporate income tax, compared to other MS. This paper provides empirical evidence on the importance for Belgium to include intangible assets into the EU apportionment formula. Moreover, it gives an idea about the amount of intangible assets in Belgium compared with other MS.

Data and methodology

Data are gathered from the Belfirst database, which contains the annual account data of Belgian firms. We collect firm-level data from the unconsolidated statements of 5,358 active Belgian firms. We use statistical regression analysis in order to investigate the profit generating capacity of both the proposed allocation factors, i.e. tangible fixed assets, sales and labour as well as the additional allocation factor, viz intangible assets. Our analyses are bases on two equations, one including intangible assets defined as the sum of concessions, patents and licenses and activated costs for R&D, and another including the activated costs for R&D separately. We use standardized beta coefficients to compare the profit generating capacity of different allocation factors. Moreover, investigating the incremental R^2 enables us to draw conclusions on the impact of adding intangible assets or capitalized R&D costs to the proposed allocation factors. Finally, a Wilcoxson sing rank test is used to investigate which formula is significantly more accurate than another.

Findings

Our results confirm the hypothesis that intangible assets contribute significantly to the creation of corporate profit. Adding intangible assets to the proposed allocation factor significantly increases the R^2 by 2.37 % points (in case of including cost of employees) and by 3.95 % points (in case of including number of employees)[5]. The same holds for adding capitalized R&D costs to the proposed allocation factors. Namely, adding R&D increases R^2 significantly by 1.49% points (cost of employees) and 2.73% points (number of employees). Further, intangible assets as well as capitalized R&D have a significant impact on corporate profit. Comparing the different formulas shows that the formula including intangible assets as well as the formula including capitalized R&D costs are significantly more accurate than

[5] To avoid problems of multicollinearity, both labour factors are not included simultaneously in one regression.

the formula excluding any form of intangible assets. In addition, the formula including intangible assets performs significantly better than the formula including capitalized R&D costs.

Academic contribution

Previous research on the apportionment formula mainly focuses on the US context. Moreover, the literature concerning the fairness of the apportionment formula is limited to the proposed allocation factors, viz sales, tangible fixed assets, and labour (Hreha and Silhan 1986; Schmidt 1986; Hines 2010). This paper contributes to the existing literature as it focuses on the fairness of the European apportionment formula in a Belgian context. In addition, we do not limit our empirical study to the proposed allocation factors but also investigate the profit generating capacity of intangible assets for Belgian companies.

3.3 Did the economic impact of CCCTB affect the voting behaviour of the Members of the European Parliament (MEPs)?

Principal topic

Together with the proposal for a CCCTB, the European Commission published an economic impact assessment of CCCTB (EC, 2011b). After the announcement, the proposal was transferred to the European Parliament (EP). As it concerns a decision about direct taxation, the consultation procedure was applied (Art. 115 of the TFEU). This implies that the final decision rests with the Council of the EU and that the European Parliament plays a consultative role. On 19 April 2012, the Members of the European Parliament (MEPs) voted on the amended CCCTB proposal. Applying a simple majority, the proposal was approved with 452 votes in favour, 172 against and 36 abstentions (VoteWatch Europe, 2012). This study focusses on the question whether or not the voting behaviour of MEPs was influenced by the estimated economic impact of CCCTB for their country.

Data and methodology

To answer our research question, we collected the voting results from the independent organization VoteWatch Europe (VoteWatch Europe, 2012). Our dependent variable

contains the voting results for each of the 654 MEPs who cast their vote on the CCCTB proposal. Each observation records whether a MEP voted 'no' or 'yes' or abstained from voting. For these 654 observations, we obtain complete information on the economic impact of CCCTB. The latter is measured by the impact of CCCTB for each MS on corporate income tax revenue, on labour and on GDP. We use statistic regression analysis and control specific variables for party, country and individual.

Findings

Our results show a significant and positive effect of the impact of CCCTB on the voting behaviour of MEPs. A higher impact of CCCTB on CIT-revenue, employment or GDP increases the likelihood of a MEP to vote in favour of the proposal. In line with prior research, we also find that the party and country position have a significant effect on the voting behaviour of the MEPs. Namely, MEPs from pro-European political parties and left oriented parties vote significantly more in favour of the proposal than MEPs from anti-European political parties and right oriented parties. Also, MEPs resident in new MS vote significantly more against the proposal than MEPs from old MS. The individual characteristics, however, did not have a significant influence on the MEPs' voting behaviour.

Academic contribution

Previous research on the voting behaviour of MEPs typically focusses on the question whether MEPs vote rather along the country line or rather along their party line. Some authors stress that MEPs vote typically along the transnational party line (Faas, 2003, Hix, 2002, Hix and Noury, 2009). However, other studies show that for some fields, especially for topics with a strong and heterogeneously defined national interest, MEPs rather vote along the country line (Aspinwall, 2002). Beside party and country variables, also individual characteristics are considered to have an impact on the voting behaviour of MEPs (Giger, 2009). To the best of our knowledge, there is no prior research covering the relationship between the voting behaviour of MEPs and the economic impact of the measures they decide on. The availability of the economic impact study of CCCTB and the fact that it was available for the MEPs, provides us with a unique research setting. Notwithstanding the fact that the EP has a consultative role in the CCCTB project, we believe that this research can give an important indication on the upcoming decision in the Council of the European Union.

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CHAPTER 2: THE EU APPORTIONMENT FORMULA: INSIGHTS FROM A BUSINESS CASE*

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Abstract

First, this paper gives an overview of the progress Europe has made in its development of a Common Consolidated Corporate Tax Base (CCCTB). Second, we use firm level data from a listed multinational to investigate how several designs for the CCCTB apportionment formula could affect the allocation of the consolidated tax base. The design is relevant in the light of member states' concern for protecting their tax revenues, as well as for the multinational companies' tax minimizing possibilities. Moreover, it plays an important role in achieving an efficient and simple tax system. Simulating different apportionment formulas, the results show that including more factors and using more equal weights distributes the common tax base more equally, which could reduce the incentive to shift factors from high to low tax countries. The results also indicate that simplifying the factor definitions, leads to rather minor changes in the allocation. Using unpublished data, this study allows to investigate the consequences of different formulas in detail, which contributes to the current discussion on corporate tax harmonization in the EU.

* A version of this paper is published in the ***Journal of Business Economics and Management***, 2013, 14(2).

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1 Introduction

In 2004, the European Union (EU) welcomed ten countries[8] of Central and Eastern Europe. Two more Eastern European countries[9] joined the EU in 2007, which brought the total number of member states (MS) to twenty-seven. Notwithstanding this big achievement, the enlargement of the EU makes some policy problems even more pressing. One such problem relates to the several tax obstacles that are currently harming the international competitiveness of multinationals. Multinationals, for example, face high compliance costs because of the different tax systems across the twenty-seven MS. Other tax obstacles concern the limitation on cross-border loss relief and the problems with transfer pricing for intra group transactions (EC, 2001a).

To remove the underlying causes of all tax obstacles, the EU wants to introduce a Common Consolidated Corporate Tax Base (CCCTB). This new tax system should contribute to the Europe 2020 growth strategy that was established by the European Commission in March 2010 (EC 2010). In particular, it has the intention to increase the efficiency, effectiveness, simplicity and transparency within the European company tax system (EC, 2001a; EC, 2001b; EC, 2006a). The tax liability of a company belonging to a CCCTB group would be determined by applying four distinct steps. Firstly, each group member has to calculate its taxable profit according to the same set of rules. Secondly, the individual tax bases are summed up to the consolidated tax base. Thirdly, the consolidated tax base is allocated to the different group members by means of an apportionment formula (AF). Finally, each MS would have the ability to tax its apportioned share at its own tax rate (Schön et al., 2008).

The aim of this paper is twofold. First, this paper gives an overview of the progress the Commission has made in its development of a possible CCCTB. Second, we use financial data from a listed multinational in order to illustrate how several designs of the AF could affect the allocation of the consolidated tax base among different group entities. More specifically, we investigate to what extent the allocation effects differ when including one or more factor(s) into the formula or putting high or low weights on the formula factors. We also study how the design of the apportionment formula is related to the intention to shift formula factors. Further, we examine the allocation effects of using simplified factor

[8] Czech Republic, Cyprus, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia. (EU, 2011)
[9] Bulgaria and Romania. (EU, 2011)

definitions instead of the more complex factor definitions proposed by the Commission. The design of the formula plays an important role in achieving an efficient and simple tax system (Spengel & Wendt, 2007). An efficient tax system should be neutral, which means that it should not influence economic agents' behaviour or distort their decisions. The AF, for example, should not introduce incentives for factor shifting (Agundez-Garcia, 2006).

Previous studies investigated the macro-economic effects of introducing an AF in Europe. Devereux and Loretz (2008) showed that the overall tax revenue would be likely to decline by 2.5% if companies could choose whether or not to participate to CCCTB. Runkel and Schjelderup (2011) found that central authorities would use apportionment weights as a corrective devise in order to reduce tax distortions. The simulation results of Bettendorf et al. (2010) showed that an AF does not weaken incentives for tax competition. Important to mention is that the results of these studies are highly dependent on the design of the formula. A drawback of the existing literature is the lack of confidential firm level data. However, using such data makes it possible to understand the complexity and relative newness of the European AF. In this research, the availability of unpublished data offered the opportunity to study the factors in detail[10]. For example, we were able to use the sales by destination factor whereas previous research always relied on the sales by origin factor[11].

The simulation results show that including more factors and using more equal weights distributes the consolidated tax base more equally. Moreover, this could reduce the incentive to shift factors from high to low tax countries, which improves the efficiency of the new tax system. The results also indicate that simplifying the factor definitions leads to rather minor changes in the allocation.

The paper is organized as follows. Section 2 gives an overview of the progress Europe has made in its development of a possible CCCTB. The development of the research questions is presented in section 3. The data and methodology are given in section 4. Section 5 presents the results and discussions. Section 6 concludes.

[10] The Commission stresses the difficulties to investigate the impact of the AF because of the lack of publicly available tax data (EC, 2006b).

[11] In contrast with sales by destination, sales by origin does not reflect the demand side to the generation of profits, for further explanations see section 3.

2 Towards a CCCTB: current position

In line with previous technical outlines, the European Commission (EC) recently launched a proposal for a CCCTB directive (EC, 2011a). In the first part of this section we describe the main discussion points of the CCCTB outlines. As our paper mainly focuses on the sharing mechanism, this issue is further explored in the second part of this section.

2.1 Overview of the main implementation issues

The CCCTB concept has its origin in the EC report 'Company Taxation in the Internal market' (EC, 2001b). According to this report, two approaches can be distinguished to tackle the company tax obstacles. A first approach would be to apply a wide variety of targeted solutions. Examples are the right implementation of the European merger directive, parent subsidiary directive and pension fund directive (EC, 2001b; Mudrack, 2007). A second approach would be to introduce a comprehensive solution. The Commission believes that CCCTB would be the best comprehensive solution to deal with all tax obstacles. Under CCCTB, the individual tax bases are consolidated and afterwards allocated to the different group members by means of an AF. In 2004, a working group (WG) was established with the aim to 'examine and discuss, from a technical perspective, all implementation issues of a common consolidated tax base for companies operating in the EU' (EC, 2007a).

A first point of interest covers the intention of the EC to implement the CCCTB as a non-compulsory system however, including an 'all-in or all-out' treatment. This treatment ensures that all qualifying members must join the regime if the group decides to apply for it (EC, 2007a). Devereux and Loretz (2008) show that the overall EU tax revenues would decline with approximately 2.5% if companies would be able to choose whether or not to participate in the system of CCCTB. If companies would not have the choice, the overall tax revenues would increase with approximately 2%. Secondly, there is the issue of the group perimeter. The definition of the group can be based on legal or economic relationships as well as on the combination of both. With regard to the legal approach, an ownership threshold of 50% could be the minimum requirement although an ownership threshold of 75% or 100% could also be an option. According to the economic approach, all related entities under common control would be integrated (Spengel & Wendt, 2007; EC, 2006a). A third issue are the third country relations, i.e. the relationships with countries outside the

EU. In order to avoid tax planning, there is a need for harmonized provisions such as anti-avoidance rules[12]. Another topic of discussion is the common set of rules used to establish and consolidate the individual corporate tax bases. Reference has been made to use IAS/IFRS or national GAAP as a starting point. Another solution could be to create a completely new set of common accounting rules (EC, 2003; Haverals, 2007; Oestreicher & Spengel 2007). Each of the possibilities has its shortcomings. Some elements of IAS/IFRS, such as the principle of fair value accounting, do not suit tax principles. As a consequence, no direct formal link can be made between IAS/IFRS and CCCTB (EC, 2006b; Spengel & Wendt, 2007). Also the use of national GAAP as a starting point has received a lot of opposition, one of the reasons being that most countries have different rules with respect to provisions. Finally, a completely new set of rules ignores each linkage between financial and tax accounting and would introduce a 28th system for tax accounting (EC, 2007a). A last important subject of discussion relates to the design of the apportionment formula, i.e. 'the sharing mechanism'. According to the Commission, the parameters under discussion are the actual number of factors included in the formula, the weights applied to the factors as well as the factors' definitions and their applicability for companies (EC, 2006b; Agundez-Garcia, 2006). This last topic will be discussed in more detail in the next subsection.

2.2 Principles of the sharing mechanism

Some of the main benefits[13] of a CCCTB arise from the consolidation aspect. However, an unavoidable consequence of consolidation is the need to distribute the consolidated tax base among the different group members.

The Commission's working paper 'The mechanism for sharing the CCCTB' (EC, 2006b) mentions three ways to share the consolidated tax base: one macro-based approach, and two firm-specific approaches namely, the Value Added Key (VA) and the Apportionment Formula (AF). The macro-based approach implies that the common tax base of any CCCTB group should be allocated to the MS with reference to factors aggregated at the national level (GDP, VAT bases, …). The Value Added Key, designed for the purpose of apportioning a

[12] An example of an anti-avoidance rule is the thin capitalization rule to limit the deductibility of interests. For further explanations see EC (2008).

[13] For example, the elimination of intra-group transactions and the offset of losses within the group. (Spengel, C. and Wendt, C., 2007).

common tax base, should be calculated as an income-type measure that accounts for depreciation allowances (Agundez-Garcia, 2006). The AF could be defined as 'a method for determining the corporate tax base of a single company or group of associated companies attributable to a MS by reference to a formula that assigns a proportionate share of the company's or associated companies' corporate tax base to the state by reference to a factor or factors that reflect (or are deemed to reflect) the underlying income-producing activities within the state' (Hellerstein, 2005).

The 'ideal' sharing approach has the intention to be simple, difficult to manipulate, and equitable (EC, 2007b; Agundez-Garcia, 2006). Moreover, it should not lead to undesirable effects in terms of tax competition. It turns out all three systems have advantages as well as drawbacks and therefore it is not appropriate to state that one method is in all respects better than the others (EC, 2006b). The greatest disadvantage of the macro-based approach is that it may decouple an individual firm's tax payment to a member country from its real economic activity in that country. With respect to the VA, the main drawback is that it reintroduces the need to value all intra-EU group transactions ('transfer pricing') as a result of the strong profit-shifting incentives . The AF is nowadays seen as the preferred approach by the Commission because of the numerous disadvantages of the first two methods (Agundez-Garcia, 2006).

The system of apportionment formula is well known in the US states and the Canadian provinces. Introduced in 1967, the 'Massachusetts' formula became widely used by the US states for some considerable time. This formula includes equally-weighted property, payroll and gross receipts factors. Since 1978 until now, about two thirds of the states have deviated from the Massachusetts formula. The most frequent deviation is to double weight the sales factor in order to attain a balance in the apportionment of income between producing (assets and payroll) and marketing states (gross receipts) (Anand & Sansing, 2000). Canada introduced a single-factor formula including a destination based gross receipts and added a payroll factor to the formula later on. In contrast to Europe, each American and Canadian state has the privilege to define its own design of the apportionment formula. For that reason, we cannot compare our results with the results for these contexts (Hey, 2008; Weiner, 2005).

Based on the Massachusetts formula, the Commission suggests a multiple-factor formula taking into account both the supply and demand side on the generation of companies' income. The supply side is traditionally represented by the production factors labour and capital, whilst the demand side is represented by sales by destination. The labour factor will be measured both by means of payroll and number of employees.

The Commission suggests to apportion a share of the consolidated tax base to a company i of a given group as follows (EC, 2007b):

$$TB_i = CTB \left[\alpha \frac{S_i}{\sum_{i=1}^{n} S_i} + \beta \left[\lambda \frac{P_i}{\sum_{i=1}^{n} P_i} + \delta \frac{E_i}{\sum_{i=1}^{n} E_i} \right] + \gamma \frac{A_i}{\sum_{i=1}^{n} A_i} \right] \quad (1)$$

CTB stands for the consolidated tax base. Subscript i denotes company i from a group of n companies. A stands for fixed tangible assets, S is sales by destination, P represents employee compensation while E stands for the number of employees. α, β and γ are the weights of the three factors such that α + β + γ = 1. The weights of the two labour factors employee compensation and number of employees are represented by λ and δ respectively and λ + δ = 1.

In the following paragraphs, a brief discussion of each factor is presented. Only the problems of the factors' determination that are relevant for this paper are discussed, other questions are left out. We want to stress the consultative character of the Commission's technical outlines. This means that these outlines have no binding force until the proposal is approved by the Council.

2.2.1 Labour

The labour factor is meant to reflect the contribution of labour as a production factor in the generation of corporate income. According to the recommendations of the CCCTB WG, the labour factor should combine the payroll factor (cost of employees) and the number of

employees factor in order to restrict the shortcomings of the two factors separately[14]. With regard to the qualifying work force, it is suggested that also interim and temporary employment should be included. The payroll costs are considered as the remunerations that qualify as a deductible expense for the purpose of calculating the tax base, including fringe benefits, social contributions and stock options. With respect to the location of labour, it is put forward to look at the place where the employees provide their services (EC, 2007b).

The economic effects of including labour in the formula have been investigated in several theoretical and empirical studies. Mc. Lure (1980) shows that the AF largely transforms the corporate income tax into separate excise taxes on whatever factor is included in the formula. When including payroll in the formula, at least a partial payroll tax is introduced. Wellisch (2000) shows that payroll apportionment would lead to an increased marginal effective wage rate, making labour more expensive. Goolsbee and Maydew (2000) empirically show in a US context that the inclusion of payroll in the apportionment scheme has a significant impact on the employment level. On the one hand, they conclude that the payroll weight has a significant negative impact on the level of within-state employment. On the other hand, they find that one state's unilateral reduction of the payroll weight in the AF lowers employment in other states. Those results favour the superiority of a uniform apportioning system for all states.

2.2.2 Assets

Although the share of intangibles, financials and currents assets can be considerably high, the Commission suggests that only fixed tangible assets should be included. The Commission argues that intangible, financial and current assets (inventory) are very mobile and could be used as a tax-planning tool to shift part of the factor from one jurisdiction to another[15]. The year end's tax written down value could be taken into account to calculate the asset factor. An alternative could be to take the average value of the tax written down value at the

[14] Wage levels significantly differ across (EU member) states and these differences form an important driving force for foreign direct investments. Including only the payroll factor into the AF would especially attribute taxable income to entities located in countries with high labour costs. However, these entities are not always the most productive ones within the group. Alternatively, including only the number of employees would attribute taxable income to entities located in labour intensive countries. Again, these entities are not always the most productive ones within the group. For further details see Agundez-Garcia (2006), Weninger (2008) and Tvaronaciciene, Grybaite and Korsakiene (2008).

[15] See for example Stein and Ginevicius (2010), Ginevicius (2010).

beginning and ending of the tax year in order to reflect the fluctuation of assets during the tax year. With respect to the location of fixed assets, it is suggested to attribute the asset to the entity which is effectively using the assets (EC, 2007b).

Most theoretical papers that examine the economic effects of the AF assume a capital investment apportionment factor, either as a single factor or in combination with other factors[16]. In general the property factor is considered as the one that introduces more distortions into a AF system because capital or investment is regarded as the most mobile factor for purposes of tax-minimizing behaviour (Agundez-Garcia, 2006).

2.2.3 Sales

The most controversial factor during the discussions in the WG was the sales factor. Next to the discussion whether or not to include a sales factor[17], a discussion is going on about sales by origin versus sales by destination. The former takes into account the place from which the goods are shipped while the latter takes into account the place in which the goods are shipped. The Commission suggests a sales by destination factor because such a factor is less easy to manipulate and would limit the overall impact on tax competition in the EU due to its 'immobility'. It is proposed that only proceeds of sales of goods and provision of services should be covered. With respect to the value of sales, the figure taken into account should be the one considered for the purpose of calculating the tax base. Moreover, it is suggested to attribute sales to the entity which is located in the member state where the final place of physical delivery is situated. The problem of nowhere sales arises when the group does not have a permanent establishment or subsidiary in the destination state of sales or if the destination state is a non-European country. There are several ways to deal with these nowhere sales. The first option is to leave these sales out of consideration. The second option includes a pure throw back rule, i.e. the nowhere sales are thrown back to the state of origin. Finally, a spread throw back rule could be applied. In this case these sales are thrown back to all group entities in proportion to the other formula factors. The Commission suggests using this spread throw back rule (EC, 2007b).

[16] See for example Wellisch (2004), Eggert and Schjelderup (2003), Pethig and Wagener (2003), Kolmar and Wagener (2004).

[17] 'Profits of companies come from selling goods/services' (EC, 2006b, p.7). Therefore, sales is 'an income-creating factor eligible to appear in a formula that seeks to estimate the contribution of each jurisdiction to group's profit (Agundez-Garcia, 2006, p.52).

Gordon and Wilson (1986) argue that the inclusion of sales by destination provokes a 'cross-hauling' distortion of output incentives. Firms that mainly produce in high tax countries (and thus face high tax burden on their input) will benefit relatively more from selling in a low tax country and vice-versa. Anand and Sansing (2000) study the economic incentives of states in case they are free to choose from different AF, with the main focus on the weight assigned to the sales factor. The observed differences across US States show that net importer states put more relative weight on the sales factor, while net exporter states put more relative weight on production factors. Gérard (2005) proves that the inclusion of a sales by destination factor reduces the mobility of the tax base under the AF, thereby pushing down tax competition effects induced by the formula.

3 Development of research questions

While the consolidated tax base brings along most of the advantages of CCCTB, at the same time it involves the need to distribute the common tax base among the different group members. As explained in section 2, it is the Commission's intention to share the consolidated tax base by using an AF based on company-specific factors. The experiences of Canada and the US therewith demonstrate the advantages of a uniform formula across MS (Weiner, 2005). Studies in these countries show that lack of uniformity can result in double taxation or under taxation. Moreover, a non-uniform formula does not maximize the social welfare of the member states (Anand & Sansing, 2000). These problems would be even worse in Europe because of the higher differences in levels of corporate tax rates (Hey, 2008). Therefore, unlike the US, European MS should not be allowed to add or eliminate factors, to change definitions or to apply different weights (EC, 2007b). In spite of the conviction to use a uniform formula[18], a discussion is going on about the actual number of allocation factors to be included, the weights applied to them and their definitions.

3.1 Varying the number of factors

Among other things, the number of factors included will influence the tax planning opportunities for the group. If the formula includes only one factor there can be a strong

[18] According to the Commission the following sectors need a sector-specific formula: financial services, transport services, television and broadcasting services (EC, 2007b).

incentive to relocate this factor to a low tax country in order to decrease the overall EU-tax rate. Important to mention is that the immobility of the factors could hamper the possibility to relocate these factors. This is one of the reasons the Commission proposes a multiple factor formula including the rather immobile combined labour factor (number of employees and costs of employees), the sales by destination factor and the fixed tangible assets factor, instead of rather mobile factors such as inventory and intangible assets. By using a multiple factor formula the reallocation incentive is reduced, i.e. the relocation of one unit of these factors would shift less than one unit of the tax base (EC, 2007b). Bearing in mind the above literature, we want to illustrate the formula's sensitivity to the number of factors included. More specifically, we investigate the following questions:

- ✓ To what extent do the allocation effects differ when assuming equal weights and varying the number of factors?
- ✓ What is the effect on the group's incentive to relocate one or more apportionment factors?

3.2 Varying the factor weights

Besides the number of factors included, the weights applied to the factors will also influence tax planning opportunities. Using a formula with more than one factor requires all factors to be weighted by a fraction so that the sum of these weights equals one. Ignoring this condition can lead to under-taxation or double taxation (EC, 2007a).

We can distinguish different methods of assigning factor weights. First, a straightforward way is to weight each factor equally. The Massachusetts formula, including the equally weighted factors property, payroll and gross receipts, became widely used by the US. Since its introduction, about two thirds of the states have deviated from the Massachusetts formula. Nowadays, the most frequent deviation is to double weight the sales factor in order to attain a balance in the apportionment of income between producing (assets and payroll) and marketing states (gross receipts) (Anand & Sansing, 2000). This second way of assigning factor weights can also be illustrated by the Canadian provinces using a two-factor payroll and gross revenue formula that is equally weighted. In the light of the European proposal, a balance between supply and demand side could be realised by weighting payroll and assets by one quarter each and sales by one half. On the contrary, if the supply or demand

approach would be favoured, greater weight could be put on the supply and demand factors respectively (Weiner, 2005; Agundez-Garcia, 2006). Finally, specific factor weights may be estimated using econometric analysis. In particular, factors may be weighted according to the specific contribution each factor makes to the overall profits (Agundez-Garcia, 2006; Weiner, 2005). Keeping in mind the above literature, we want to illustrate the formula's sensitivity to the weights applied to the factors. More specifically, we examine the following questions :

- ✓ To what extent do the allocation effects differ when assuming three factors and varying the weights applied to these factors?
- ✓ What is the effect on the group's incentive to relocate one or more apportionment factors?

3.3 Varying the factor definitions

Another important issue is the applicability of the formula. The Commission suggests to apply several tax corrections to the book values of fixed tangible assets and labour. Moreover, the Commission wants to use a spread throw back rule in case of nowhere sales. Instead of using the Commission's definitions, one could opt for more easily defined factors. If using more easily defined factors results in minor changes to the allocation of the common tax base, the higher compliance costs[19] the proposed definitions bring along are more difficult to justify. On the contrary, the higher compliance cost could possibly be justified if using more easily defined factors results to major changes in the allocation. In this research we leave the size of the compliance costs out of consideration and focus on the possible changes in allocation effects when using different factor definitions. We investigate the following question:

- ✓ To what extent do the allocation effects differ when using simplified factor definitions instead of the more complex factor definitions as proposed by the Commission?

[19] Compliance costs can be defined as 'costs incurred by taxpayers in meeting the requirements laid on them by the law and revenue authorities, over and above the actual payment of tax and over and above any distortion costs inherent in the nature of the tax' (Sandford, 1995, p.1).

4 Data collections and methodology

4.1 Company details

To assess the effects of several designs for the AF, we use data of 2007 from a listed multinational active in the clothing manufacturing sector. All core activities of the multinational are conducted at the headquarters in Belgium, including design and product development, purchasing policy, administration, distribution, management of sales and marketing.

The structure of the group serves our research purposes for several reasons. Firstly, the group has entities in 11 European countries and four non-European countries. The presence of several European entities is interesting in the context of CCCTB because this system wants to reduce the high compliance costs resulting from all the different tax systems. Secondly, notwithstanding the fact that the group structure consists of several entities, it is not too complicated to use for this research. Thirdly, the group's structure gives the opportunity to apply the spread throw back rule, since part of the sales goes to European countries where the group has no taxable entity as well as to non-European countries. Finally, the difference in taxable profit between the current system of separate accounting (SA) and CCCTB can be illustrated. Under SA, almost all turn-over is generated in Belgium and by consequence taxed in Belgium. On the contrary, under CCCTB this turn-over will be allocated to all group entities which implies that it will be taxed in different MS.

Appendix 1 presents the structure of the company during the financial year 2007. We name each entity after the country where it is located. If the group decides to apply for CCCTB, 'the all-in or all-out principle' is used, i.e. all qualifying subsidiaries and permanent establishments must join the regime. To be a qualifying subsidiary, 75% or more of its voting rights should be owned directly or indirectly (i.e. through a chain of participation) by the parent company[20] (EC, 2007). The entities that are directly owned for 75% or more are Italy, Great Britain, the Netherlands, Luxembourg1, Hungary, Finland, France1, Germany1, Germany2, Spain and Denmark. The entities indirectly entering the group are France2 and Germany3, which are both held by the Dutch subsidiary. The entities perform different

[20] In order to calculate the parents indirect ownership each respective holding percentage should be multiplied. A direct holding that is more than 75% is considered as 100%. For further details see EC, 2007.

activities. The Hungarian subsidiary is a production entity whereas France2 and Germany3 are retailers. The other subsidiaries are agencies responsible for the local sellers and work on commission. The Belgian parent company continues to be responsible for billing customers in these countries.

4.2 Data collection

To gather the necessary data we studied public available data such as the annual accounts and reports. Moreover, we obtained confidential data from the chief accountant and had three meetings with him to get full explanation on the acquired data.[21].Table 1 presents the collected entity data necessary to apply the AF for the group.[22]

- The factor *assets (A)* represents the average tax written down value of the fixed tangible assets at the beginning (31/12/2006) and at the end (31/12/2007) of the fiscal year 2007.[23]
- The combined labour factor consists of both payroll and number of employees. *Payroll (P)* includes the fiscally accepted costs of workers, employees and directors for the year 2007.[24] This is increased by the fiscally accepted costs of temporary workers and students.[25] The number of employees (E) is calculated as the average number of workers, employees and directors for the fiscal year 2007. The average number of temporary workers and students is added.[26]
- The factor *sales (S)* consists of sales attributed to each particular entity in 2007, i.e. sales by destination[27]. In case of nowhere sales[28], the sales are thrown back according to the spread throw back rule[29].

[21] We had three conversations with the chief accountant from approximately two to three hours each.
[22] Detailed definitions of how to define the factors are given in subsection 2.2.
[23] Only the Belgian tax written down value needed a correction for exaggerated depreciation.
[24] Only the Belgian payroll costs, as mentioned in the profit and loss accounts 2007, needed a correction for rejected expenses regarding luncheon vouchers.
[25] Temporary workers and students were only present in Belgium.
[26] If the required data was not available we used the number at the end of the year 2007.
[27] Intra-group sales are excluded from this calculation. Sales by destination are the sales going to the consumers located in a particular country. These sales are attributed to one or more group members that are present in this country.
[28] For a definition of nowhere sales see subsection 2.2.
[29] Remark that the Belgian group also sells goods to consumers located in a EU country with no taxable presence (e.g. Poland and Austria) and to consumers located outside the EU (e.g. Canada and the US). These sales are thrown back according to the spread throw back rule and using the classic three factor formula as explained under methodology. Thrown back sales are part of 15% of the total sales.

- Taxable profit represents the individual profit as mentioned in the corporate tax declaration. Taxable group profit (total) equals the sum of taxable profits (according to national rules) of all entities. The group profit takes into account loss compensation but does not eliminate possible intra-group profit.

From Table 1 we can see that Belgium has the largest amount of fixed tangible assets (€12,162,944), employees (431), payroll (€15,505,091) and sales (€44,682,307). Hungary has the second largest amount with respect to assets (€1,856,927), employees (368) and payroll (€2,620,295). For Hungary the sales (by destination) are relatively low (€3,726,075) because it only receives part of the group sales as a result of the spread throw back rule and not as a result of goods sold to this country. The second largest amount of sales goes to Germany3 (€17,653,032). Notice that there are some relatively small entities like Great-Britain, Luxembourg, Germany1 and Denmark[30]. In the last column the taxable profit of each entity is mentioned. We can see that Belgium has the largest amount of taxable profit (€36,951,548) followed by Hungary (€990,480) and the Netherlands (€616,511).

[30] Great Britain and Denmark are agencies that only include commissions as revenues and payroll as costs. Germany1 is a 'Verwaltung', i.e. a company established for reasons of directors' liability. Luxembourg1 is a reinsurance company.

Table 1 Descriptive statistics for the CCCTB entities

	Assets (A)	Employees (E)	Payroll (P)	Sales (S)	Taxable profit
Belgium	12,162,944	431	15,505,091	44,682,307	36,951,548
Italy	327	1	165,521	1,783,780	87,685
Great-Britain	0	3	242,297	8,008,093	10,117
Netherlands	59,513	6	375,243	16,892,369	616,511
Luxembourg	0	0	0	718,302	108,891
Hungary	1,856,927	368	2,620,295	3,726,075	990,480
Finland	3,225	2	95,040	2,831,084	139,277
France1	3,476	15	946,976	5,288,804	–27,296
Germany1	0	0	0	0	3,422
Germany2	9,194	15	1,111,216	7,764,997	–203,052
Spain	690	3	161,869	4,241,011	0
Denmark	0	1	32,635	6,644,563	–96,571
France2	420,634	12	254,873	10,093,698	358,606
Germany3	600,893	15	515,229	17,653,032	–496,551
TOTAL	15,117,822	873	22,026,284	130,328,117	38,443,066
minimum	0	0	0	0	–496,551
maximum	12,162,944	431	15,505,091	44,682,307	36,951,548
mean	1,079,844	62	1,573,306	9,309,151	2,745,933
median	3,350	5	248,585	5,966,684	48,901

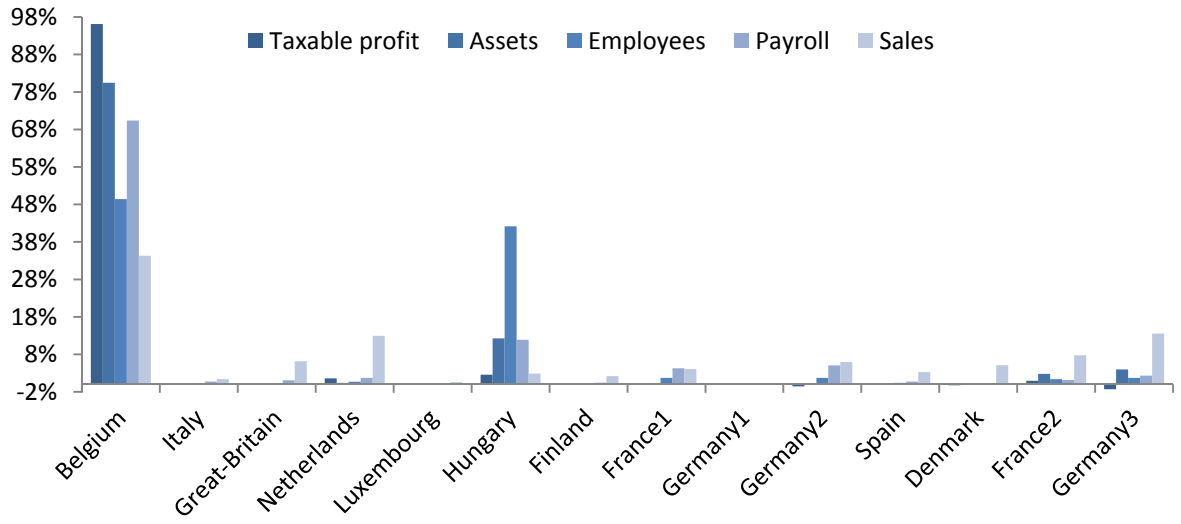
The factor *assets* represents the average tax written down value of the fixed assets at the beginning and at the end of the fiscal year 2007. *Payroll* includes the costs of workers, employees and directors as mentioned in the profit and loss accounts 2007, increased by the costs of temporary workers and students. The *number of employees* is calculated as the average number of workers, employees and directors for the fiscal year 2007. The average number of temporary workers and students are added. The factor *sales* are sales going to each particular CCCTB entity in 2007, i.e. sales by destination. In case of nowhere sales, the sales are thrown back according to the spread throw back rule.

4.3 Methodology

Using the collected data from Table 1, Figure 1 gives a first indication of the possible distribution effects of the different apportionment factors. The different bars illustrate the entity shares in the taxable group profit as well as the entity shares in the factors used for apportionment. If an entity has a disproportionately large share of a factor used for apportionment compared with its share in the taxable profit, it will get a larger share of the taxable profit under AF than under SA. In this case it would be profitable for the group that such an entity is located in a low tax country. When looking at the figure, we can make some interesting remarks. First, we can see that Belgium has the largest share in the taxable profit as well as the largest shares in all proposed factors. Nevertheless, compared with the other group entities also Hungary, subject to the lowest tax rate of the group, has a reasonably

high share in fixed tangible assets, the number of employees and payroll. Second, we can notice that loss-making entities that do not contribute to the taxable group profit, are not necessarily free of paying taxes under the new system. For example, the loss-making entity Germany3 will still get taxable profit due to their positive fixed tangible assets, number of employees, payroll and sales by destination.

Figure 1 ES in taxable group profit and ES in factors used for apportionment



Using the simulation technique, we will evaluate the effects of the number of factors included into the formula as well as the effects of the weights applied to these factors. In order to do this, we form two sets of formulas represented in Table 2. The first set represents 'the factor formulas' that include one, two or three factors when assuming equal weights. We name F3 the classic three factor formula. This is the formula proposed by the Commission including the three equally weighted factors sales by destination, combined labour and fixed tangible assets. The second set contains 'the weight formulas' applying equal or less equal weights when assuming a three factor formula. Formula Wa uses equal weights, codes starting with Wb adopt weights of ½, ¼ and ¼ whereas codes with Wc apply even more unequal weights, namely 2/3, 1/6 and 1/6. We choose weights that are in line with realistic weights of AF in the US (Weiner, 2005). Also, the Commission is interested in simulations using these weights (EC, 2007c). Analogous to Table 2 we form factor formulas and weight formulas including only payroll or number of employees as a labour factor. The

same codes are used, adding a 'P' when payroll is included as labour factor and adding an 'E' when number of employees is included as labour factor. When simulating different AF, we assume the common tax base as given.[31]

Table 2 Factor and weight formulas

Factor	Formulas	Weight	Formulas
F1a	$ES_i = \frac{S_i}{S}$	Wa	$ES_i = \frac{1}{3}\frac{S_i}{S} + \frac{1}{3}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{3}\frac{A_i}{A}$
F1b	$ES_i = \frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}$	Wb0	$ES_i = \frac{1}{2}\frac{S_i}{S} + \frac{1}{4}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{4}\frac{A_i}{A}$
F1c	$ES_i = \frac{A_i}{A}$	Wb1	$ES_i = \frac{1}{4}\frac{S_i}{S} + \frac{1}{2}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{4}\frac{A_i}{A}$
F2a	$ES_i = \frac{1}{2}\frac{S_i}{S} + \frac{1}{2}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}]$	Wb2	$ES_i = \frac{1}{4}\frac{S_i}{S} + \frac{1}{4}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{2}\frac{A_i}{A}$
F2b	$ES_i = \frac{1}{2}\frac{S_i}{S} + \frac{1}{2}\frac{A_i}{A}$	Wc0	$ES_i = \frac{2}{3}\frac{S_i}{S} + \frac{1}{6}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{6}\frac{A_i}{A}$
F2c	$ES_i = \frac{1}{2}\frac{A_i}{A} + \frac{1}{2}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}]$	Wc1	$ES_i = \frac{1}{6}\frac{S_i}{S} + \frac{2}{3}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{6}\frac{A_i}{A}$
F3	$ES_i = \frac{1}{3}\frac{S_i}{S} + \frac{1}{3}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{1}{3}\frac{A_i}{A}$	Wc2	$ES_i = \frac{1}{6}\frac{S_i}{S} + \frac{1}{6}[\frac{1}{2}\frac{P_i}{P} + \frac{1}{2}\frac{E_i}{E}] + \frac{2}{3}\frac{A_i}{A}$

For each entity the different formulas result in an entity share (ES) and in an entity percentage payable (EPP). An ES is the share an entity gets of the common tax base when a specific formula is applied. The EPP on the common tax base is the product of its ES and the corporate tax rate (CTR) applied in its country:

$$EPP_i = ES_i * CTR_i \quad (2)$$

Adding these EPP_i results in the global corporate tax rate for the group (GCTR):

$$GCTR = \sum_{i=1}^{n} (ESi * CTRi) \quad (3)$$

Where subscript i denotes entity i from a group of n entities.

[31] The calculation of the common tax base is beyond the scope of this research.

Finally, we look at the allocation effects of using simplified factor definitions instead of the more complex factor definitions as proposed by the Commission. To study these allocation effects we first look at the impact of simplifying one factor while keeping the others constant. Afterwards, we consider the allocation impact of including all three simplified factors. We simplify *assets* by using the book value of fixed tangible assets on the 31th of December 2007 instead of the average of the tax written down value at the beginning (31th December 2006) and ending of the tax year (31th December 2007). We simplify the *combined labour factor* by defining the work force as the average number of workers, employees and directors in 2007 and their payroll costs as the costs mentioned in the profit and loss accounts 2007. According to the European proposal the work force should also include temporary workers and students and payroll cost should be the fiscally accepted costs. With respect to the *sales by destination factor* we take into account a pure throw back rule instead of the proposed spread throw back rule[32]. A pure throw back rule implies that all sales that are going to a European country where the group lacks a taxing nexus or to a non-European country (i.e. 'nowhere' sales), are thrown back to the state of origin. By contrast, a spread throw back rule assigns these sales to all group entities in proportion to the other formula factors.

5 Results and discussion

5.1 Apportionment formula

Table 3 shows the corporate tax rates applied on each country's taxable profit for the fiscal year 2007. The corporate tax rates are the nominal tax rates including surcharges and local profit taxes if applicable.[33] We see that Hungary applies the lowest corporate tax rate whereas Belgium applies the highest.

[32] Theoretical section 2.2.3 also mentions a throw out rule to deal with these nowhere sales. Because nowhere sales can be considerably high, the throw out rule is the least plausible option and therefore we do not consider this rule in our simulations.

[33] For practical reasons we do not consider progressive tax rates.

Table 3 Nominal corporate tax rates, 2007

	Tax rate (%)		Tax rate (%)
Belgium	33.99%	Hungary	21.28%
Italy	27.50%	Finland	26.00%
Great-Britain	30.00%	France	33.33%
Netherlands	25.50%	Germany	29.80%
Luxembourg	30.38%	Spain	32.50%
Denmark	25.00%		

Source: EC, 2011b

5.1.1 Varying the number of factors

Table 4 contains the ES each entity gets from the common tax base when simulating the different factor formulas (Panel A). The table also contains the EPP on the common tax base as well as the GCTR of the group when simulating these factor formulas (Panel B).

From Panel B we can see that the group has the lowest GCTR when applying the formula only including the combined labour factor (F1b). Under these circumstances, the GCTR equals 30.09%. This favourable result can be explained by the fact that the combined labour factor is abundantly present in Hungary, the country with the lowest tax rate of the group. When we have a look at Panel A, formula F1b apportions 27.03% of the common tax base to Hungary, which is the highest ES of all ES going to Hungary.

Panel A also illustrates that the more factors included into the formula, the more chance the Belgian group would get an equally distributed common tax base. For the one-factor formulas (F1),the minimum and maximum share an entity can get from the common tax base is 0% and 80.45% respectively. The two-factor formulas (F2) apportion a minimum of 0% and a maximum of 70.18% to an entity, while the three-factor formula finds a minimum of 0% and a maximum of 58.22%. We can see that the spread between the minimum and the maximum shares an entity can get becomes smaller as more factors are included.

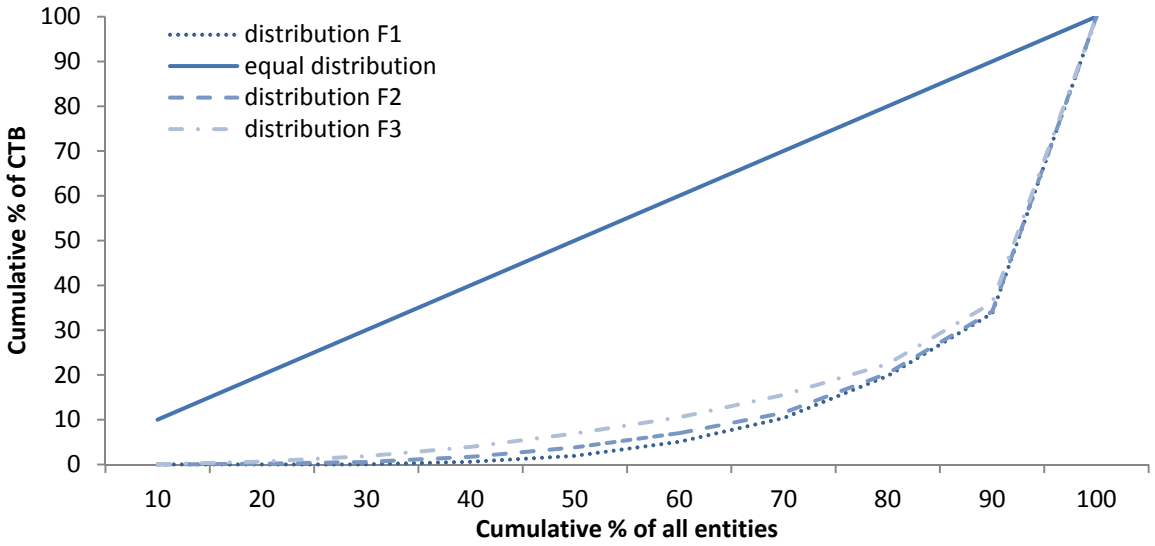
Table 4 Entity shares (ES) of the common tax base and entity percentages payable (EPP) on the common tax base, simulating the factor formulas

	Panel A: Entity shares (ES) in %							Panel B: Entity percentages payable (EPP) in %						
	F1a	F1b	F1c	F2a	F2b	F2c	F3	F1a	F1b	F1c	F2a	F2b	F2c	F3
BE	28.18	59.91	80.45	46.35	58.12	70.18	58.22	9.58	20.36	27.35	15.75	19.75	23.85	19.79
IT	1.56	0.43	0.00	0.92	0.67	0.22	0.60	0.43	0.12	0.00	0.25	0.18	0.06	0.17
GB	7.13	0.72	0.00	3.46	3.05	0.36	2.29	2.14	0.22	0.00	1.04	0.91	0.11	0.69
NE	15.03	1.20	0.39	7.11	6.65	0.79	4.85	3.83	0.30	0.10	1.81	1.70	0.20	1.24
LU	0.64	0.00	0.00	0.28	0.28	0.00	0.18	0.20	0.00	0.00	0.08	0.08	0.00	0.06
HU	0.00	27.03	12.28	15.48	7.03	19.66	14.06	0.00	5.75	2.61	3.29	1.50	4.18	2.99
FI	2.51	0.33	0.02	1.26	1.09	0.18	0.84	0.65	0.09	0.01	0.33	0.28	0.05	0.22
FR1	6.60	3.01	0.02	5.51	0.06	1.52	2.36	2.20	1.00	0.01	1.84	0.02	0.51	0.79
GER1	7.34	0.00	0.00	0.00	0.00	0.00	0.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00
GER2	7.34	3.38	0.06	7.50	0.18	1.72	3.13	2.19	1.01	0.02	2.24	0.05	0.51	0.93
SP	3.76	0.56	0.00	1.93	1.61	0.28	1.27	1.22	0.18	0.00	0.63	0.52	0.09	0.41
DE	5.95	0.13	0.00	2.62	2.54	0.07	1.74	1.49	0.03	0.00	0.65	0.64	0.02	0.44
FR2	6.60	1.27	2.78	2.58	7.19	2.02	3.93	2.20	0.42	0.93	0.86	2.40	0.67	1.31
GER3	7.34	2.03	3.97	5.00	11.54	3.00	6.52	2.19	0.60	1.18	1.49	3.44	0.89	1.94
	100	100	100	100	100	100	100							
GCTR (%)								30.50	30.09	32.21	30.27	31.48	31.15	30.97

The distribution of the common tax base is also visualised in Figure 2. This figure represents a graph which uses the concept of a Lorenz curve applied to the distribution of the common tax base among entities. All entities are arranged from smallest to largest concerning their ES of the common tax base. Afterwards, these shares are cumulated. The results show that the more factors included into the formula, the more the distribution of the common tax base approaches an equal distribution.

Similar results are found when simulating the one, two and three factor formulas using payroll or number of employees as their labour factor. For an overview of these results, we refer to Appendix 2.

Figure 2 Distribution of the common tax base resulting from the one, two and three factor formulas



A more equally distributed common tax base, as a result of including more factors into the formula, could reduce the incentive to shift one or more allocation factor(s). The relocation of one unit of these factors would shift less than one unit of the common tax base. In order to illustrate this, we assume the extreme case where the Belgian group would shift all Belgian fixed tangible assets to its entity located in the low tax country Hungary. Table 5 represents the distribution of the consolidated tax base before and after shifting. Our starting point are the figures of the tax year 2007 from Table 1. This table shows that the Belgian entity has an amount of €12,162,944 fixed tangible assets which equals 80.45% of the total amount. For the one factor formula including assets (F1c), the relocation of this 80.45% from the Belgian entity to the Hungarian entity effectively shifts 80.45% (92.74% - 12.28%) of the common tax base to the Hungarian entity. Looking at the two factor formulas including assets (F2b and F2c), the relocation of 80.45% of total assets only shifts 46.08% (53.11% - 7.03%) and 40.23% (59.89% - 19.66%) of the common tax base to the Hungarian entity. For the three factor formula the distribution effect is the smallest, namely the relocation only shifts 28.77% (42.83%– 14.06%) of the common tax base to the Hungarian entity. When shifting labour or sales from a high tax country to a low tax country, similar results could be found. In brief, our example illustrates that the incentive to shift an allocation factor could be reduced by including more factors into the formula.

Table 5 ES of the common tax base before and after shifting (factor formulas including assets)

	ES before shifting (tax year 2007) in %				ES after shifting in %			
	F1c	F2b	F2c	F3	F1c	F2b	F2c	F3
BE	80.45	58.12	70.18	58.22	0.00	12.04	29.95	29.45
IT	0.00	0.67	0.22	0.60	0.00	0.67	0.22	0.60
GB	0.00	3.05	0.36	2.29	0.00	3.05	0.36	2.29
NE	0.39	6.65	0.79	4.85	0.39	6.65	0.79	4.85
LU	0.00	0.28	0.00	0.18	0.00	0.28	0.00	0.18
HU	12.28	7.03	19.66	14.06	92.74	53.11	59.89	42.83
FI	0.02	1.09	0.18	0.84	0.02	1.09	0.18	0.84
FR1	0.02	0.06	1.52	2.36	0.02	0.06	1.52	2.36
GER1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	0.06	0.18	1.72	3.13	0.06	0.18	1.72	3.13
SP	0.00	1.61	0.28	1.27	0.00	1.61	0.28	1.27
DE	0.00	2.54	0.07	1.74	0.00	2.54	0.07	1.74
FR2	2.78	7.19	2.02	3.93	2.78	7.19	2.02	3.93
GER3	3.97	11.54	3.00	6.52	3.97	11.54	3.00	6.52
	100	100	100	100	100	100	100	100

5.1.2 Varying the factor weights

Table 6 contains the ES (Panel A) and the EPP (Panel B) when simulating the weight formulas. From Panel B we can see that the group has the lowest GCTR when applying the formula putting the largest weight (2/3) on the combined labour factor (Wc1). Under these circumstances the GCTR equals 30.53%. This favourable result can again be explained by the fact that the combined labour factor is abundantly present in Hungary. When we have a look at Panel A, formula Wc1 apportions 20.55% of the common tax base to Hungary, which is the highest ES of all ES going to Hungary.

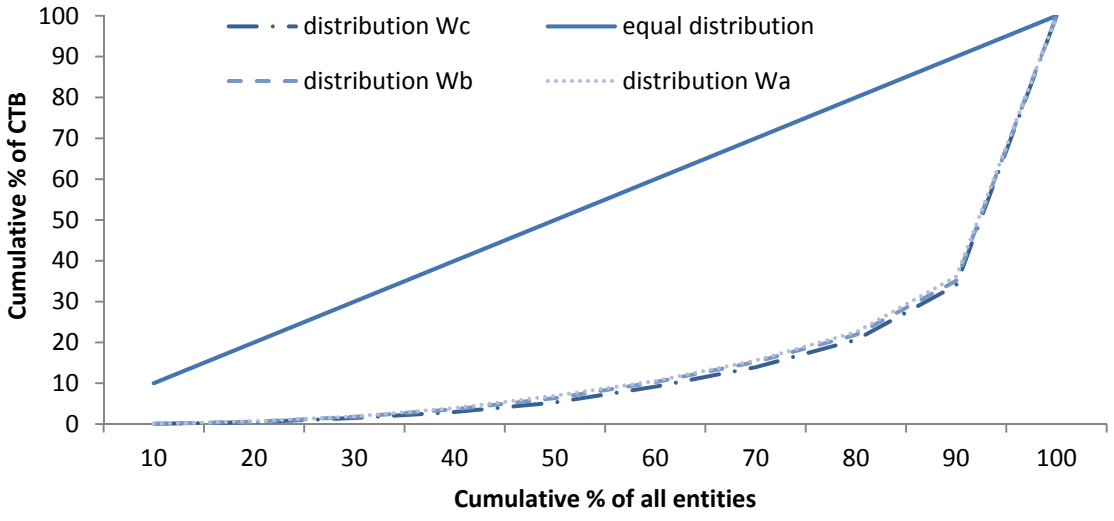
Panel A also illustrates that the more equal the weights are, the more chance the Belgian group would get an equally distributed common tax base. When applying the most unequal weights (Wc0, Wc1, Wc2), the minimum apportionment share an entity can get is 0% and the maximum share 69,33%. Less unequal weights (Wb0, Wb1, Wb2) result in a minimum share of 0% and a maximum share of 63.78%. The equally weighted three factor formula (Wa) leads to a minimum of 0% and a maximum of 58.22%. We can see that the spread between the minimum and maximum shares an entity can get becomes smaller when applying more equal weights.

Table 6 ES of the common tax base and EPP on the common tax base, simulating weight formulas

	Panel A: Entity percentages (ES) in %							Panel B: Entity percentages payable (EPP) in %						
	Wa	Wb0	Wb1	Wb2	Wc0	Wc1	Wc2	Wa	Wb0	Wb1	Wb2	Wc0	Wc1	Wc2
BE	58.22	52.23	58.64	63.78	46.25	59.06	69.33	19.79	17.75	19.93	21.68	15.72	20.07	23.57
IT	0.60	0.79	0.56	0.45	0.98	0.52	0.30	0.17	0.22	0.15	0.12	0.27	0.14	0.08
GB	2.29	3.25	1.90	1.72	4.22	1.51	1.14	0.69	0.98	0.57	0.51	1.27	0.45	0.34
NE	4.85	6.88	3.94	3.74	8.91	3.02	2.62	1.24	1.75	1.00	0.95	2.27	0.77	0.67
LU	0.18	0.28	0.14	0.14	0.37	0.09	0.09	0.06	0.08	0.04	0.04	0.11	0.03	0.03
HU	14.06	11.26	17.30	13.61	8.46	20.55	13.17	2.99	2.40	3.68	2.90	1.80	4.37	2.80
FI	0.84	1.17	0.71	0.64	1.51	0.59	0.43	0.22	0.31	0.19	0.17	0.39	0.15	0.11
FR1	2.36	2.79	2.52	1.78	3.21	2.69	1.19	0.79	0.93	0.84	0.59	1.07	0.90	0.40
GER1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	3.13	3.84	3.20	2.37	4.55	3.26	1.60	0.93	1.14	0.95	0.70	1.35	0.97	0.48
SP	1.27	1.77	1.09	0.96	2.26	0.92	0.64	0.41	0.57	0.36	0.31	0.74	0.30	0.21
DE	1.74	2.58	1.34	1.31	3.42	0.94	0.87	0.44	0.65	0.34	0.33	0.86	0.23	0.22
FR2	3.93	4.88	3.26	3.64	5.84	2.60	3.36	1.31	1.63	1.09	1.21	1.95	0.87	1.12
GER3	6.52	8.27	5.39	5.88	10.03	4.27	5.25	1.94	2.47	1.61	1.75	2.99	1.27	1.56
	100	100	100	100	100	100	100							
GCTR (%)								30.97	30.87	30.75	31.28	30.78	30.53	31.59

The distribution of the common tax base as a result of applying equal and less equal weights is also visualised in Figure 3. The Lorenz curves show that the more equal the factor weights are, the more the distribution of the common tax base approaches an equal distribution.

Figure 3 Distribution of the common tax base resulting from the weight formulas



A more equally distributed common tax base, as a result of applying more equal weights to the factors, could reduce the incentive to shift one or more allocation factor(s). In order to illustrate this, we follow the same procedure as explained under 'varying the number of factors'. The results in Table 7 show that the distribution effect of shifting the assets from the Belgian to the Hungarian entity is the smallest when applying the formula with equal weights. In this case the relocation only shifts 28.77% (Wa) of the common tax base to the Hungarian entity. Bigger shares of the common tax base are shifted when formulas are used that apply less equal weights, namely 41.69% (Wb2) and 54.61% (Wc2). In brief, our example illustrates that the incentive to shift an allocation factor could be reduced by applying more equal weights to the allocation factors.

Similar results are found when simulating the weight formulas using payroll or number of employees as their labour factor. For an overview of these results, we refer to Appendix 2.

Table 7 ES of the common tax base before and after shifting (weight formulas including assets)

ES before shifting (tax year 2007) in %				ES after shifting in %		
	Wa	Wb2	Wc2	Wa	Wb2	Wc2
BE	58.22	63.78	69.33	29.45	22.09	14.72
IT	0.60	0.45	0.30	0.60	0.45	0.30
GB	2.29	1.72	1.14	2.29	1.72	1.14
NE	4.85	3.74	2.62	4.85	3.74	2.62
LU	0.18	0.14	0.09	0.18	0.14	0.09
HU	14.06	13.61	13.17	42.83	55.30	67.78
FI	0.84	0.64	0.43	0.84	0.64	0.43
FR1	2.36	1.78	1.19	2.36	1.78	1.19
GER1	0.00	0.00	0.00	0.00	0.00	0.00
GER2	3.13	2.37	1.60	3.13	2.37	1.60
SP	1.27	0.96	0.64	1.27	0.96	0.64
DE	1.74	1.31	0.87	1.74	1.31	0.87
FR2	3.93	3.64	3.36	3.93	3.64	3.36
GER3	6.52	5.88	5.25	6.52	5.88	5.25
	100	100	100	100	100	100

5.1.3 Varying the factor definitions

Table 8 gives the ES and the GCTR when using more easily defined factor definitions. These results concern simplifications of the classic three factor formula. We first look at the impact of simplifying one factor while keeping the others constant. Table 8 shows that simplifying

the factor definition of assets (ii) results in a maximum entity change in the allocation of the common tax base of only 2.93% (FR2). Using a more easy combined labour factor (iii) leads to a maximum change of only 1.14% (HU). Applying the pure throw back rule in order to simplify the sales by destination factor (iv) results in a maximum change of 37.20% (GER3). On the group level, simplifying assets leads to rather minor changes into the GCTR (relative change of 0.03%). The same conclusion can be made when simplifying the combined labour factor (relative change of 0.07%). Applying the pure throw back rule results in a somewhat higher change into the GCTR (relative change of 0.44%). Secondly, we look at the allocation effects when including all three simplified factors (v). In this case, the entity change is limited to 38.55% (GER3) and the relative change in the GCTR equals 0.4%.

We cannot generalize these results because of the particularity of each case. However, these results indicate that it would be interesting to study the average effect on a large scale sample. If using simplified factor definitions on average leads to rather minor changes in the allocation of the common tax base, it could be appropriate to investigate whether or not the higher compliance costs the proposed definitions bring along are justified.

Finally, we would like to mention that especially applying the spread throw back rule is a complex matter. However, using a less complex pure throw back rule instead of the spread throw back rule transforms the sales by destination factor into a more origin-based factor and as a consequence disturbs the balance between the supply and demand side of profit generating factors. This also re-introduces tax planning opportunities to manipulate the starting points of exports. Keeping this in mind, it is desirable to apply a spread throw back rule to nowhere sales. In order to solve the remaining problem of complexity, it could be helpful to reach multinational groups a computer-based tool that enables them to apply the spread throw back rule without great efforts.

Table 8 ES of the common tax base and the global corporate tax rates (GCTR) using simplified factors

Factor definitions formula F3
(i) non simplified assets, combined labour and sales by destination
(ii) simplified assets
(iii) simplified combined labour
(iv) simplified sales by destination
(v) simplified assets, combined labour and sales by destination

		(i)	**(ii)**	**(iii)**	**(iv)**	**(v)**
BE	ES (%)	58.22	58.45	58.01	59.66	59.68
	% change		*0.40*	*–0.36*	*2.48*	*2.52*
IT	ES (%)	0.60	0.60	0.60	0.59	0.59
	% change		*–0.01*	*0.20*	*–1.75*	*–1.58*
GB	ES (%)	2.29	2.29	2.29	2.27	2.27
	% change		*0.00*	*0.10*	*–0.76*	*–0.67*
NE	ES (%)	4.85	4.90	4.85	4.81	4.86
	% change		*0.99*	*0.09*	*–0.79*	*0.21*
LU	ES (%)	0.18	0.18	0.18	0.18	0.18
	% change		*0.00*	*0.00*	*0.00*	*0.00*
HU	ES (%)	14.06	14.00	14.22	13.11	13.20
	% change		*–0.40*	*1.14*	*–6.78*	*–6.09*
FI	ES (%)	0.84	0.84	0.84	0.83	0.83
	% change		*–0.12*	*0.15*	*–1.01*	*–0.98*
FR1	ES (%)	2.36	2.36	2.37	2.89	2.90
	% change		*–0.05*	*0.45*	*22.37*	*22.75*
GER1	ES (%)	0.00	0.00	0.00	2.09	2.09
	% change		*(ii–i)/0*	*(iii–i)/0*	*(iv–i)/0*	*(v–i)/0*
GER2	ES (%)	3.13	3.13	3.14	3.24	3.25
	% change		*–0.12*	*0.36*	*3.34*	*3.61*
SP	ES (%)	1.27	1.27	1.27	1.26	1.26
	% change		*0.00*	*0.17*	*–1.07*	*–0.92*
DE	ES	1.74	1.74	1.74	1.74	1.74
	% change		*0.00*	*0.03*	*–0.18*	*–0.15*
FR2	ES (%)	3.93	3.82	3.94	3.23	3.13
	% change		*–2.93*	*0.15*	*–17.81*	*–20.40*
GER3	ES (%)	6.52	6.42	6.52	4.09	4.00
	% change		*–1.55*	*0.13*	*–37.20*	*–38.55*
GCTR (%)		30.97	30.97	30.94	31.10	31.09
	% change		*0.03*	*–0.07*	*0.44*	*0.40*

5.2 Consolidated tax base and apportionment formula

Notwithstanding our research focus on the AF, we also want to take a look at the global effect of applying CCCTB, i.e. taking into account the effects of the consolidated tax base as well as the effect of the AF. For each entity as well as for the group, Table 9 shows the tax payable under SA and CCCTB using the classic three factor formula.

Table 9 Total tax payable under SA versus CCCTB using F3

	Tax payable		Switch from SA to CCCTB			
	SA	CCCTB	Absolute difference	Loss-offset effect	Formula effect	Proportion in total tax difference
BE	12,559,831	7,606,894	–4,952,937	–162,944	–4,789,994	399%
IT	24,113	63,568	39,455	–1,362	40,816	–3%
GB	3,03	263,969	260,934	–5,654	266,588	–21%
NE	157,210	475,467	318,257	–10,185	328,442	–26%
LU	33,081	21,456	–11,625	–460	–11,165	1%
HU	210,774	1,150,121	939,347	–24,636	963,983	–76%
FI	36,212	84,091	47,879	–1,801	49,680	–4%
FR1	0	302,825	302,825	–6,487	309,312	–24%
GER1	1,020	0	–1,020	0	–1,020	0%
GER2	0	358,988	358,988	–7,690	366,678	–29%
SP	0	158,986	158,986	–3,406	162,391	–13%
DE	0	167,539	167,539	–3,589	171,127	–14%
FR2	119,523	503,698	384,175	–10,789	394,964	–31%
GER3	0	746,509	746,509	–15,991	762,500	–60%
Group	13,144,800	11,904,112	–1,240,688	–254,992	–985,696	100%

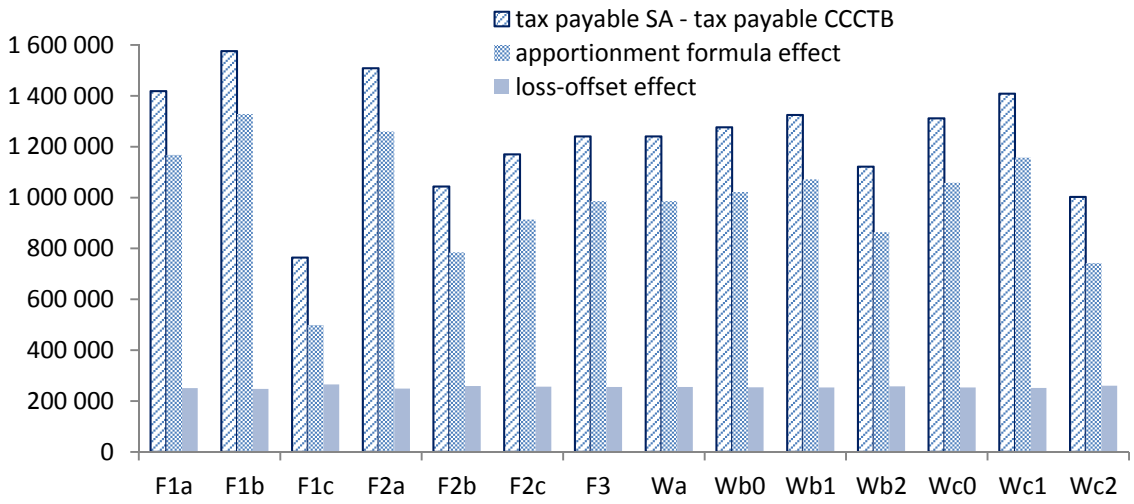
In order to calculate the consolidated tax base, we simply add the separate taxable profits of all group entities and settle possible losses. No adjustments are made for possible intra-group profits. Thus, the calculated taxable profits are a simplification of how the statutory profit and loss accounts could be consolidated for tax purposes. Consolidation not only relates to intra-group loss relief but also to the determination of the common rules to

identify revenues and costs. Furthermore, there will be a need for common rules to eliminate intra-group transactions and to treat EU outbound and inbound investments[34]. From Table 8 we can see that the switch from SA to CCCTB reduces the tax payable with €1,240,688 (€13,144,800- €11,904,112). This can be explained by the fact that under CCCTB the Belgian parent company, facing a high tax rate, receives considerably less taxable profit, whereas the Hungarian entity, facing a low tax rate, gets more. This reveals itself also in the proportions these entities have in the total difference in tax payable (BE 399% and HU -76%). Remark also that loss making entities like France1, Germany2, Germany3 and Denmark, that do not pay taxes under SA, receive part of the consolidated tax base under CCCTB and by consequence have to pay taxes. Further, each tax difference can be split up into 'the loss-offset consolidation effect' and 'the apportionment formula effect'. On the group level, the tax difference of €1,240,688 is caused by a loss offset effect of €254,992 and by an apportionment effect of €985,696.

We repeat the same calculations to determine the tax difference between SA and CCCTB for all simulated formulas on the group level. The results are presented in Figure 4. For each formula the first bar indicates that total tax payable under CCCTB is always lower than under SA. Both 'the loss-offset consolidation effect' and 'the apportionment formula effect' positively influence the total tax payable, but the apportionment formula effect dominates. Formula F1b is the most favourable for the group. This formula, containing the combined labour factor, generates an absolute tax difference of €1,575,756. Under these circumstances Hungary gets a bigger part of the total tax base because of its disproportional large share in labour.

[34] For a discussion of the literature see Schön, Screiber, Spengel (2008) and EC (2007a).

Figure 4 Differences in total tax payable under SA versus CCCTB



Using payroll or number of employees as labour factor, similar results are found when varying the number of factors, the factor weights and factor definitions.

6 Conclusion

The European Commission (EC) has the intention to establish a Common Consolidated Corporate Tax Base (CCCTB) in order to increase the efficiency, effectiveness, simplicity and transparency of the European company tax system. Under CCCTB, the individual tax bases are consolidated and afterwards allocated to the different group members by means of an apportionment formula (AF). The relevance of this topic is stressed again by the recent launching of a proposal for a CCCTB directive (March 16th 2011). The aim of this paper is twofold. First, this paper gives an overview of the progress Europe has made in its development of a possible CCCTB. Second, this study uses firm level data from a listed multinational in order to assess how several designs of the apportionment formula could affect the allocation of the consolidated tax base. The design of the AF is important in the light of achieving an efficient and simple tax system. We investigate to what extent the allocation effects differ when including one or more factor(s) into the formula or putting high or low weights on the formula factors. Moreover, we study how the design of the apportionment formula is related to the intention to shift formula factors. Further, we examine the allocation effects of using simplified factor definitions instead of the more

complex factor definitions as proposed by the Commission. Given the opportunity to use unpublished data, we could investigate the apportionment factors in detail.

The simulation results show that the design of the apportionment formula is important in affecting the distribution of the common tax base. Specifically, including more factors and using more equal weights distributes the common tax base more equally, which could reduce the group's incentive to shift factors from high to low tax countries. These results suggest that in order to create an efficient formula, i.e. a formula not causing any behavioural distortions, more factors should be included. Also, applying more equal weights to the factors could contribute to this aim. The results also indicate that for this company simplifying the factor definitions as proposed by the Commission, leads to rather minor changes in the allocation of the common tax base. This could imply that there is no need to introduce complex factors definitions. Moreover, uncomplicated definitions contribute to the establishment of a more simple and transparent tax system. However, we are not big proponents of simplifying the sales by destination factor. Simplifying this sales factor, by applying the pure throw back rule instead of the spread throw back rule, transforms the factor into a more origin based factor. Therefore, we suggest the Commission to reach multinational groups a computer-based tool enabling them to apply the spread throw back rule without great efforts.

The main shortcoming of our research is the particularity of each case, so that we cannot generalize the research results. However, these results can give some important indications for future research. It would be interesting to investigate if other studies find similar results. Further, this study introduces questions about the factor elasticity. If an apportionment factor is shifted from one country to another, one could ask to what extent other factors are shifted too. Also, the interaction between the common tax base and the sharing mechanism is an interesting topic for further research.

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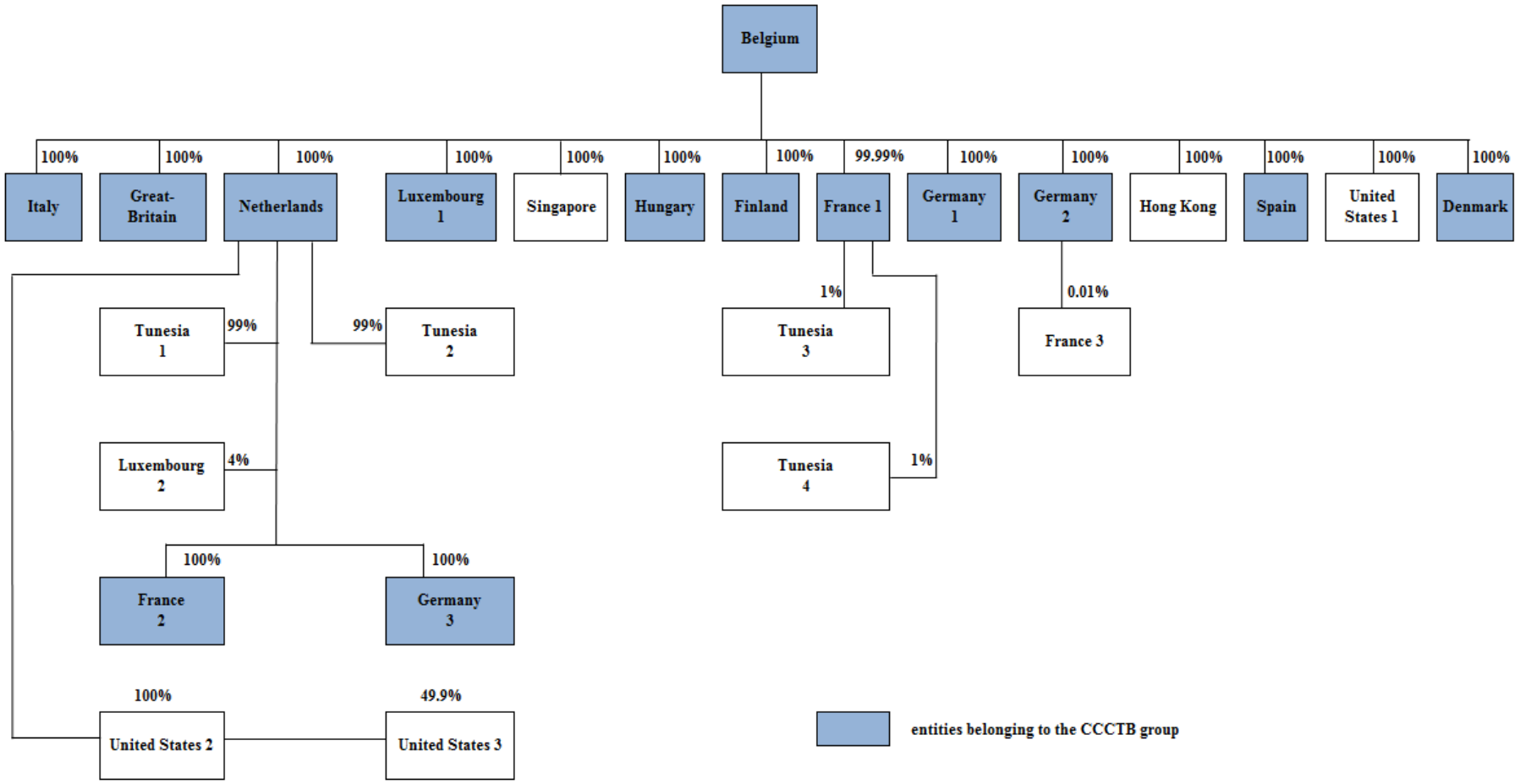
Appendix 1 Structure of the Belgian group in 2007 with CCCTB entities



Appendix 2

A. Entity shares of the common tax base resulting from all factor formulas (in %)

	F1a	F1b	F1c	F2a	F2b	F2c	F3	F1bP	F2aP	F2cP	F3P	F1bE	F2aE	F2cE	F3E
BE	28.18	59.91	80.45	46.35	58.12	70.18	58.22	70.39	52.35	75.42	61.96	49.42	40.34	64.94	54.47
IT	1.56	0.43	0.00	0.92	0.67	0.22	0.60	0.75	1.10	0.38	0.72	0.11	0.73	0.06	0.49
GB	7.13	0.72	0.00	3.46	3.05	0.36	2.29	1.10	3.68	0.55	2.42	0.34	3.24	0.17	2.15
NE	15.03	1.20	0.39	7.11	6.65	0.79	4.85	1.70	7.40	1.05	5.03	0.69	6.82	0.54	4.67
LU	0.64	0.00	0.00	0.28	0.28	0.00	0.18	0.00	0.28	0.00	0.18	0.00	0.28	0.00	0.18
HU	0.00	27.03	12.28	15.48	7.03	19.66	14.06	11.90	6.81	12.09	8.65	42.17	24.15	27.23	19.47
FI	2.51	0.33	0.02	1.26	1.09	0.18	0.84	0.43	1.32	0.23	0.88	0.23	1.20	0.13	0.81
FR1	6.60	3.01	0.02	5.51	0.06	1.52	2.36	4.30	6.91	2.16	3.04	1.72	4.12	0.87	1.68
GER1	7.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	7.34	3.38	0.06	7.50	0.18	1.72	3.13	5.04	9.32	2.55	4.02	1.72	5.69	0.89	2.25
SP	3.76	0.56	0.00	1.93	1.61	0.28	1.27	0.73	2.03	0.37	1.34	0.38	1.83	0.19	1.21
DE	5.95	0.13	0.00	2.62	2.54	0.07	1.74	0.15	2.63	0.07	1.75	0.11	2.61	0.06	1.74
FR2	6.60	1.27	2.78	2.58	7.19	2.02	3.93	1.16	1.86	1.97	3.67	1.38	3.30	2.08	4.19
GER3	7.34	2.03	3.97	5.00	11.54	3.00	6.52	2.34	4.32	3.16	6.34	1.72	5.69	2.85	6.69
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

B. Entity shares of the common tax base for all weight formulas (in %)

	Wa	Wb0	Wb1	Wb2	Wc0	Wc1	Wc2	WaP	WbP0	WbP1	WbP2	WcP0	WcP1	WcP2	WaE	WbE0	WbE1	WbE2	WcE0	WcE1	WcE2
BE	58.22	52.23	58.64	63.78	46.25	59.06	69.33	61.96	55.24	64.07	66.59	48.51	66.18	71.21	54.47	49.23	53.20	60.96	43.99	51.94	67.46
IT	0.60	0.79	0.56	0.45	0.98	0.52	0.30	0.72	0.88	0.72	0.54	1.05	0.73	0.36	0.49	0.70	0.39	0.37	0.92	0.30	0.24
GB	2.29	3.25	1.90	1.72	4.22	1.51	1.14	2.42	3.36	2.09	1.82	4.30	1.76	1.21	2.15	3.14	1.70	1.62	4.14	1.25	1.08
NE	4.85	6.88	3.94	3.74	8.91	3.02	2.62	5.03	7.02	4.20	3.87	9.02	3.37	2.71	4.67	6.73	3.67	3.60	8.80	2.68	2.53
LU	0.18	0.28	0.14	0.14	0.37	0.09	0.09	0.18	0.28	0.14	0.14	0.37	0.09	0.09	0.18	0.28	0.14	0.14	0.37	0.09	0.09
HU	14.06	11.26	17.30	13.61	8.46	20.55	13.17	8.65	6.92	9.46	9.56	5.20	10.27	10.46	19.47	15.59	25.15	17.67	11.72	30.82	15.88
FI	0.84	1.17	0.71	0.64	1.51	0.59	0.43	0.88	1.20	0.77	0.66	1.53	0.65	0.45	0.81	1.15	0.66	0.61	1.49	0.52	0.41
FR1	2.36	2.79	2.52	1.78	3.21	2.69	1.19	3.04	3.48	3.36	2.29	3.93	3.67	1.53	1.68	2.09	1.69	1.27	2.50	1.70	0.85
GER1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	3.13	3.84	3.20	2.37	4.55	3.26	1.60	4.02	4.75	4.27	3.03	5.48	4.53	2.04	2.25	2.93	2.12	1.70	3.61	1.99	1.16
SP	1.27	1.77	1.09	0.96	2.26	0.92	0.64	1.34	1.82	1.19	1.00	2.30	1.04	0.67	1.21	1.72	1.00	0.91	2.23	0.80	0.61
DE	1.74	2.58	1.34	1.31	3.42	0.94	0.87	1.75	2.59	1.35	1.31	3.42	0.95	0.87	1.74	2.58	1.33	1.30	3.42	0.93	0.87
FR2	3.93	4.88	3.26	3.64	5.84	2.60	3.36	3.67	4.53	3.04	3.45	5.38	2.42	3.23	4.19	5.24	3.49	3.84	6.30	2.78	3.49
GER3	6.52	8.27	5.39	5.88	10.03	4.27	5.25	6.34	7.93	5.34	5.75	9.52	4.34	5.16	6.69	8.62	5.45	6.01	10.54	4.21	5.33
	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

C. Entity percentage payable on the common tax base and global nominal tax rates for all factor formulas (in %)

	F1a	F1b	F1c	F2a	F2b	F2c	F3	F1bP	F2aP	F2cP	F3P	F1bE	F2aE	F2cE	F3E
BE	9.58	20.36	27.35	15.75	19.75	23.85	19.79	23.93	17.80	25.64	21.06	16.80	13.71	22.07	18.51
IT	0.43	0.12	0.00	0.25	0.18	0.06	0.17	0.21	0.30	0.10	0.20	0.03	0.20	0.02	0.13
GB	2.14	0.22	0.00	1.04	0.91	0.11	0.69	0.33	1.10	0.17	0.73	0.10	0.97	0.05	0.65
NE	3.83	0.30	0.10	1.81	1.70	0.20	1.24	0.43	1.89	0.27	1.28	0.18	1.74	0.14	1.19
LU	0.20	0.00	0.00	0.08	0.08	0.00	0.06	0.00	0.08	0.00	0.06	0.00	0.08	0.00	0.06
HU	0.00	5.75	2.61	3.29	1.50	4.18	2.99	2.53	1.45	2.57	1.84	8.97	5.14	5.79	4.14
FI	0.65	0.09	0.01	0.33	0.28	0.05	0.22	0.11	0.34	0.06	0.23	0.06	0.31	0.03	0.21
FR1	2.20	1.00	0.01	1.84	0.02	0.51	0.79	1.43	2.30	0.72	1.01	0.57	1.37	0.29	0.56
GER1	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	2.19	1.01	0.02	2.24	0.05	0.51	0.93	1.50	2.78	0.76	1.20	0.51	1.70	0.27	0.67
SP	1.22	0.18	0.00	0.63	0.52	0.09	0.41	0.24	0.66	0.12	0.43	0.12	0.59	0.06	0.39
DE	1.49	0.03	0.00	0.65	0.64	0.02	0.44	0.04	0.66	0.02	0.44	0.03	0.65	0.01	0.43
FR2	2.20	0.42	0.93	0.86	2.40	0.67	1.31	0.39	0.62	0.66	1.22	0.46	1.10	0.69	1.40
GER3	2.19	0.60	1.18	1.49	3.44	0.89	1.94	0.70	1.29	0.94	1.89	0.51	1.70	0.85	1.99
GNTR	30.50	30.09	32.21	30.27	31.48	31.15	30.97	31.84	31.27	32.02	31.59	28.35	29.27	30.28	30.34

D. Entity percentage payable on the common tax base and global nominal tax rates for all weight formulas (in %)

	Wa	Wb0	Wb1	Wb2	Wc0	Wc1	Wc2	WaP	WbP0	WbP1	WbP2	WcP0	WcP1	WcP2	WaE	WbE0	WbE1	WbE2	WcE0	WcE1	WcE2
BE	19.79	17.75	19.93	21.68	15.72	20.07	23.57	21.06	18.77	21.78	22.63	16.49	22.49	24.20	18.51	16.73	18.08	20.72	14.95	17.66	22.93
IT	0.17	0.22	0.15	0.12	0.27	0.14	0.08	0.20	0.24	0.20	0.15	0.29	0.20	0.10	0.13	0.19	0.11	0.10	0.25	0.08	0.07
GB	0.69	0.98	0.57	0.51	1.27	0.45	0.34	0.73	1.01	0.63	0.55	1.29	0.53	0.36	0.65	0.94	0.51	0.48	1.24	0.37	0.32
NE	1.24	1.75	1.00	0.95	2.27	0.77	0.67	1.28	1.79	1.07	0.99	2.30	0.86	0.69	1.19	1.72	0.94	0.92	2.24	0.68	0.65
LU	0.06	0.08	0.04	0.04	0.11	0.03	0.03	0.06	0.08	0.04	0.04	0.11	0.03	0.03	0.06	0.08	0.04	0.04	0.11	0.03	0.03
HU	2.99	2.40	3.68	2.90	1.80	4.37	2.80	1.84	1.47	2.01	2.03	1.11	2.19	2.23	4.14	3.32	5.35	3.76	2.49	6.56	3.38
FI	0.22	0.31	0.19	0.17	0.39	0.15	0.11	0.23	0.31	0.20	0.17	0.40	0.17	0.12	0.21	0.30	0.17	0.16	0.39	0.13	0.11
FR1	0.79	0.93	0.84	0.59	1.07	0.90	0.40	1.01	1.16	1.12	0.76	1.31	1.22	0.51	0.56	0.70	0.56	0.42	0.83	0.57	0.28
GER1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
GER2	0.93	1.14	0.95	0.70	1.35	0.97	0.48	1.20	1.41	1.27	0.90	1.63	1.35	0.61	0.67	0.87	0.63	0.51	1.08	0.59	0.34
SP	0.41	0.57	0.36	0.31	0.74	0.30	0.21	0.43	0.59	0.39	0.33	0.75	0.34	0.22	0.39	0.56	0.33	0.30	0.72	0.26	0.20
DE	0.44	0.65	0.34	0.33	0.86	0.23	0.22	0.44	0.65	0.34	0.33	0.86	0.24	0.22	0.43	0.64	0.33	0.33	0.85	0.23	0.22
FR2	1.31	1.63	1.09	1.21	1.95	0.87	1.12	1.22	1.51	1.01	1.15	1.79	0.81	1.08	1.40	1.75	1.16	1.28	2.10	0.93	1.16
GER3	1.94	2.47	1.61	1.75	2.99	1.27	1.56	1.89	2.36	1.59	1.71	2.84	1.29	1.54	1.99	2.57	1.62	1.79	3.14	1.25	1.59
GNTR	30.97	30.87	30.75	31.28	30.78	30.53	31.59	31.59	31.37	31.65	31.74	31.16	31.71	31.90	30.34	30.37	29.84	30.81	30.41	29.35	31.27

CHAPTER 3: THE EUROPEAN APPORTIONMENT FORMULA: THE ROLE OF INTANGIBLE ASSETS IN BELGIUM

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Abstract

A vexed question in the history of a Common Consolidated Corporate Tax Base is whether the apportionment formula (AF) should include intangible assets into its assets factor. The European Commission proposes an AF that only partly and temporarily includes intangible assets. This study provides empirical evidence on the importance for Belgium to include intangible assets into the European AF. Namely, an AF that results in a fair distribution of the consolidated tax base among the different member states, should include factors that represent the profit generating capacity of firms as closely as possible. Our results show that including intangible assets significantly increases the accuracy of the AF to explain the variation in corporate profit.

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1 Introduction

On 16 March 2011, the European Commission (EC) released a proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB). The aim of this harmonized tax system is to remove some of the major obstacles to growth in the single market. The absence of harmonized tax rules in Europe often leads to double taxation, high compliance costs and transfer pricing problems (EC, 2001). The CCCTB proposal offers European companies[37] a single set of tax rules and the possibility of filing a single tax return for their entire activity in the European Union. The proposal consists of a complete set of rules to determine the corporate tax base of a company choosing for this new tax system. The new system would consist of four major steps. Firstly, each company calculates its individual tax base according to the same set of rules. Secondly, a consolidated tax base (CTB) is established on the group level. Thirdly, by means of an apportionment formula (AF)[38], the CTB is shared among the different group entities. Finally, each Member State (MS) applies its own tax rate to the specific share of the overall tax base (EC, 2011).

As revenue implications for the Member States will highly depend on the allocation mechanism, the AF is, and has been, a key question in the CCCTB history. According to the Commission, the formula should be enforceable, simple, cost efficient and difficult to manipulate. It should also lead to a fair distribution of the CTB (EC, 2007a). With respect to the manipulation issue, it is important to mention that formula apportionment could introduce new tax planning opportunities. Namely, companies could reallocate apportionment factors to MS with a low corporate income tax in order to reduce the average EU-tax rate of a CCCTB group[39]. In other words, tax planning is transferred to the allocation factors. To reduce these tax planning opportunities, the apportionment factors should be chosen adequately (Schreiber and Führich, 2007). Further, to obtain a fair distribution, the allocation of the CTB should be closely related to the profit generating factors of the underlying entities (Agundez-Garcia, 2006; Hellerstein, 2005). For those reasons, the Commission proposed an AF which takes into account three company specific

[37] It has to be noted that not only multinationals, but also stand-alone companies can choose for this new tax system.

[38] During the first meeting on the sharing mechanism, the other two possible sharing mechanisms: apportionment based on macro factors and value added key, had been put aside because of their important shortcomings. For more detail, see EC (2007a).

[39] The average tax rate of a group can be defined as the sum of each MS's tax rate multiplied by the share of the CTB allocated to the specific MS.

factors namely, assets, labour and sales. These company specific factors are to be given equal weights (EC, 2011).

In this paper, we focus on the asset factor. The inclusion of intangibles into this factor has been widely discussed. During the first meeting of the Subgroup on the Sharing Mechanism (SG6), the prevailing opinion of the attending tax experts[40] was that intangibles should be included into the AF (EC, 2007b). This opinion seems rather obvious, as nowadays intangibles are seen as an important profit-generating factor (Hellerstein & McLure, 2004; Hellerstein, 2005). As a consequence, leaving out intangibles could lead to an unfair distribution of the CTB for MS owning relatively more intangibles. However, at the second meeting of the SG6, it was suggested to exclude intangibles from the formula due to problems with valuation, location and manipulations. The valuation issue relates to the self-generated intangibles, as it is difficult to reach a consensus on how to value these assets. Even when there is an agreement on how to value intangibles, their location could be uncertain. Namely, intangibles are often used by part of the group or by the entire group. Moreover, as intangibles are very mobile, including them in the formula would introduce tax planning opportunities (EC, 2007a). Finally, experts argue that intangible assets will be indirectly included through the factors payroll and tangible fixed assets, through for example researchers' salaries and research-related assets (EC, 2007a). As a reactions to the exclusion of intangibles, the Business Europe[41] Task Force on CCCTB states that the exclusion should be well-founded, given the sometimes high share of intangibles in the total of assets of a company and their important income creating capacity (Business Europe, 2007).

This paper intends to inform the on-going debate concerning the inclusion of intangible capital in the European apportionment formula by answering two main questions. Firstly, how important is the amount of Belgian capitalized intangible capital as part of firms' total assets? Secondly, is there a profit generating capacity of intangibles for Belgian firms? We thereby focus on capitalized R&D expenses as it is clear from the literature that these investments become more and more important in the current knowledge-based economy.

[40] Experts from Austria, Belgium, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Latvia, Luxembourg, Netherlands, Poland, Slovenia, Spain and Sweden attended the meeting.

[41] Business Europe stands up for all-sized enterprises in the 34 European countries to make sure that the voice of business is heard in European policy-making. They interact regularly with the European Parliament, European Commission and the Council on issues that influence the performance of European companies. (www.businesseurope.eu)

Previous research focusing on the fairness of the apportionment formula is limited to the proposed allocation factors: sales, tangible assets and labour (Hreha and Silhan 1986; Schmidt 1986; Hines 2010). Moreover, most literature concerning an apportionment formula is based on US data. This research contributes to the existing literature by focusing on the importance for Belgium to include intangible assets into the European apportionment formula. To investigate the impact of intangible assets on corporate profit, we use firm level data from 5,358 Belgian companies that are active in the service or manufacturing sector. Our results indicate that intangible assets, defined as the sum of 'capitalized R&D costs' and 'concessions, patents and licences', have a significant and positive impact on the creation of profit. Academic researchers as well as policy makers mainly focus on the growing importance of R&D investments, due to the current evolution towards a more knowledge based economy. Therefore, we also include the factor capitalized R&D costs separately. We find a positive and significant contribution of capitalized R&D costs to the creation of profit. In addition, our results show both the formula adding intangible assets to the proposed allocations factors and the formula adding capitalized R&D costs, perform significantly better than the formula only including the proposed factors. Moreover, the formula adding intangible assets is more precise in explaining profit than the formula including capitalized R&D costs.

This paper is organized as follows. The second section briefly presents the related literature concerning firms' intangible capital and describes the Belgian accounting regulations. The third section provides details on the Belgian R&D investments compared to the other EU MS in the context of the Europe 2020 strategy. The econometric model, hypothesis and data are presented in the fourth section. The results are discussed in section five and sections six offers some concluding remarks.

2 Firms' intangible capital: literature and the controversial accounting regulations

There is a large consensus among scientists and policymakers on the growing importance of intangible assets as part of corporate total assets and national wealth. For example, Bontempi and Mairess (2008) show that for Italian manufacturing firms, intangible assets amounts to one-third of tangible assets. Corrado et al. (2005) find that in 1999 the US business investments in intangible assets were roughly the same as the investments in

tangible capital at that time. In a later study, Carrado et al. (2009) examine whether this increase in investments in intangibles is reflected in real output. They find that the inclusion of intangible assets makes a significant difference in explaining economic growth. Namely, the growth rates of output and output per worker grow more rapidly when intangibles are included compared to the baseline case in which intangible capital is ignored (Corrado et al., 2009). Marrocu et al. (2011) analyse firm specific data of companies that are active in the manufacturing and service sectors and resident in one of the six EU countries included in their sample[42]. All six countries show a clear tendency to increase the share of intangibles with respect to tangibles for the years 2002 and 2006. On average, the ratio of intangible to tangible capital raises from 34% in 2002 to 42% in 2006. Their empirical results show a positive influence of internal knowledge capital and intangible assets on firms' productivity (Marrocu et al., 2011). The growing importance of intangibles is also shown by Hulten and Hao (2008), who find that R&D expenditures and organizational capital amounts to 57% of the total assets. Hou and Johri (2009) use theoretical models to explain these empirical findings. They focus thereby on the variation in US corporate profits and on the fact that profits are more volatile than output resulting from the returns to scale in labour and tangible assets. To explain this extra volatility in profits, they include intangible assets as a third production factor, in addition to labour and tangible assets from the standard real business cycle. Their model, including intangible assets, can simulate a degree of profit volatility that is roughly the same as the degree of volatility found in US data. Moreover, without the intangible assets, the model fails to replicate these data. In addition, they find that investments in intangible assets are substantial in magnitude and pro-cyclical, i.e. tend to increase when the economy is growing quickly. Dettori et al. (2012) assess the economic performance of human, social and technological capital at the regional level in Europe. Their results provide evidence that these intangible assets enhance economic growth. In their conclusion, they stress the importance of policy strategies aimed at accelerating the accumulation of the intangible assets which constitute highly effective production endowments (Dettori et al., 2012).

The above literature confirms the current evolution towards a more knowledge based economy. However, some researchers focus not only on the growing amount and the value

[42] The six countries included in their sample are: France, Italy, The Netherlands, Spain and Sweden (Marrocu et al., 2001).

creating capacity of intangible assets but also on the accounting regulations for intangibles, and especially for R&D expenses. These regulations have been a controversial issue all over the world (Lev and Sougiannis, 1996; Stickels, 1996; Siegel and Borgia, 2007). The key issue is whether firms should have the discretion to capitalize R&D expenses or if they should be obliged to fully expense these costs. On the one hand, R&D activities can be seen as an investment of time and money in order to create future economic benefits. Accordingly, R&D expenses should be capitalized and depreciated over their useful life. The empirical results of Abrahams and Sidhu (1998) suggest that capitalised R&D is value-relevant and that R&D accruals increase the association between accounting-based and market-based performance measures. Consequently, the disclosure of R&D expenses would reduce information asymmetries between investors and management. Therefore, Abrahams and Sidhu (1998) argue that R&D expenses should be recorded on the balance sheet. Aboody and Lev (2000) also show that higher R&D intensity is associated with greater insider gains at the firm level and argue that R&D related information asymmetry can be reduced by capitalizing development costs. McGrattan and Prescot (2010) show that investments in intangible assets should be recognized in the economic growth model in order to explain economic fluctuations at a maximum level. On the other hand, as there is no reliable way to predict future economic benefits resulting from R&D expenses, some authors believe these costs should be expensed in order to obtain a reliable income statement (Stickels, 1996). In addition, allowing management the discretion to capitalize R&D, gives them the possibility to manipulate the reported accounting numbers. Their policy choice can be driven by managerial opportunism rather than providing additional information to the investors (Abrahams and Sidhu, 1998).

Consequently, whether or not we can find elements such as publicity expenses, employee training, patents, R&D expenditures on the balance sheet, depends on the applied accounting regulations. As we focus in this study on Belgium firms, we go into more detail on the Belgian accounting regulations concerning intangible assets. Moreover, we focus on ‘concessions, patents and licences’ and ‘capitalized R&D costs’, as these intangibles are the key variables in our analyses described in section 4 and 5.

The Belgian accounting regulations prescribe that statutory statements should be conform the Belgian General Accepted Accounting Principles (BEGAAP). For consolidated statements,

a distinction is made between listed and unlisted companies. Namely, consolidated statements of listed companies should be conform the International Financial Reporting Standards (IFRS). Whereas the consolidated statements of unlisted companies can be conform IFRS or BEGAAP, depending on the companies' choice (Royal Decree of 18/01/2005). Following the international accounting standards, the requirements for intangible assets are outlined in 'IAS 38 Intangible Assets'. According to this standard, an intangible asset is an identifiable[43], non-monetary and non-physical asset which is recognized in the balance sheet when the following criteria are met: the costs of the asset can be measured reliably and it is probable that future economic benefits are attributable to the asset and will flow to the entity. In case of R&D expenses, a distinction is made between the cost of research, which cannot be capitalized and the cost of development, which can be capitalized (IAS 38). Different from the IFRS standards, the Belgian accounting standards[44] list the items that can be activated as an intangible assets. The items included are: 'R&D expenses', 'concessions, patents, licenses, knowhow, brands and other similar rights', 'goodwill' and 'advance payments'. The intangibles should be (i) identifiable and (ii) earn future returns.

As the empirical research only includes data from statutory statements, we go into more detail on the valuation rules for intangible assets conform BEGAAP. To value intangibles conform BEGAAP, a distinction is made between intangibles that are acquired externally, internally generated intangibles and intangibles obtained by a contribution in kind. The latter intangibles are valued at the amount agreed on (Art. 39 Corporation Code), whereas the former intangibles are valued at the cost of acquisition. Intangible assets that are generated internally are valued at construction costs (Art. 37 Corporation Code). However, internally generated intangibles can only be activated insofar that the acquisition costs does not exceed a careful estimation of future returns for the company involved (Art. 60 Corporation Code). Contrary to IFRS standards, BEGAAP does not make a distinction between expenses for research or for development.

[43] An asset is identifiable if it is (a) separable, i.e. capable of being separated and sold, transferred, licensed, rented, or exchanged, either individually or together with a related contract or (b) arises from contractual or other legal rights, regardless of whether those rights are transferable or separable from the entity or from other rights and obligations. (IAS 38)

[44] Article 95, §1 of Royal Decree of January 30th 2001 includes what is expected of intangible capital as part of total capital on the balance sheet in the Belgian Accounting regulations.

3 The Europe 2020 Strategy

The previous section shows that the current evolution towards a knowledge-based economy makes intangibles, and especially R&D expenses, an important part of firms' total assets. The growing importance of R&D investments is also reflected in the Europe 2020 strategy (EC, 2010). The EC developed this strategy to come out stronger from the European crisis. The strategy aims towards a smart, sustainable and inclusive growth[45] in Europe. In this respect, Europe puts five headline targets related to R&D investments, employment, climate/energy, early school leavers and poverty first. Concerning the target related to the R&D investments, the EC aims to invest 3% of the EU's GDP in R&D[46] by 2020[47] (EC, 2010). To make sure that each MS contributes to this strategy, the Commission proposes that this EU goal is translated into national targets and strategies. Figure 1 shows the national targets for R&D investments by 2020 and the actual figures for 2013 of the gross domestic expenditures on R&D as a percentage of GDP[48]. The Belgian policymakers have made the commitment to invest 3% of their GDP in R&D by 2020 (Dumont and Teirlinck, 2010; EC, 2014). For the other MS, the targets range from 0.5% for Cyprus to 4% for Sweden and Finland. Five MS have set the same target as Belgium and only three have set a higher aim. During 2013, Belgium invested 2.25% of its GDP in R&D, only six MS invested more, with a maximum for Finland that invested 3.32% of its GDP. These MS's targets and their actual figures for 2013 give an indication of the size of investments in R&D over the different MS. MS that have a disproportional larger share in R&D expense compared to the other MS will stand to lose more of the CTB, and consequently income taxes, when intangibles would be left out of the European AF. In short, MS that have set higher targets on investing in a knowledge-based economy through R&D expenses, will relatively benefit more from including intangibles in the asset factor of the AF.

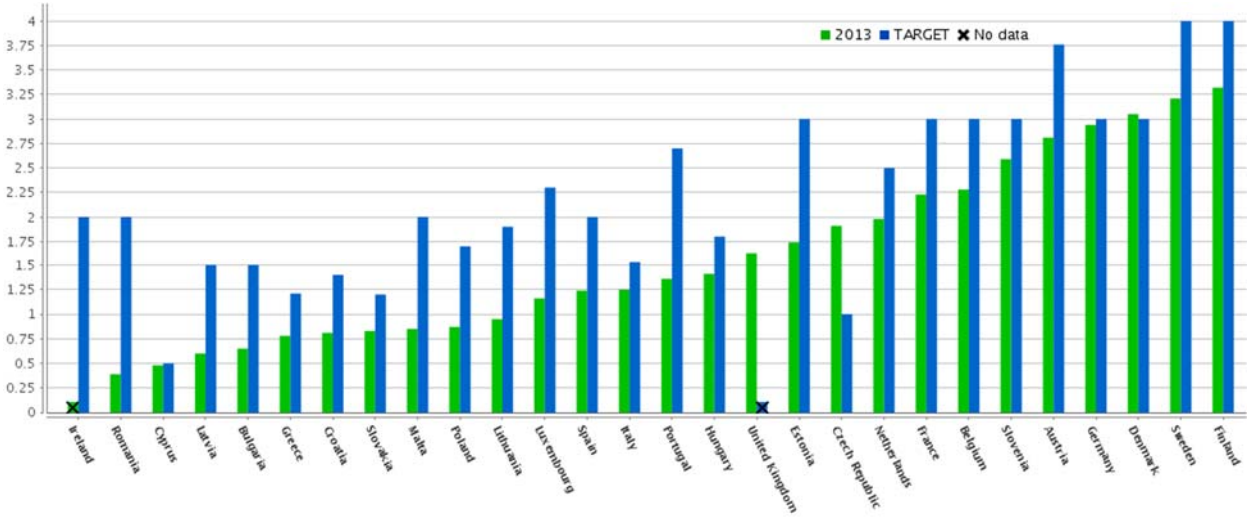
[45] Smart: developing an economy based on knowledge and innovation; sustainable: promoting a more resource efficient, greener and more competitive economy; inclusive: fostering a high-employment economy delivering social and territorial cohesion.

[46] 3% of the GDP should be invested in R&D, of which 2/3 in the private sector.

[47] For more detail on the other targets, see EC, 2010.

[48] "Research and experimental development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society and the use of this stock of knowledge to devise new applications" (Frascati Manual, 2002 edition, § 63).

Figure 1 Research and development expenditure as percentage of GDP, Europe2020 targets and numbers for 2013



Source: Eurostat

4 Empirical model, hypotheses and data

The European AF, which aims to share the CTB among the various MS in which a CCCTB group is active, should include factors that represent the profit generating capacity of firms (Agundez-Garcia, 2006; Hellerstein, 2005; EC 2007a). The EC proposes to calculate the tax base of a group member A as follows:

$$Share\ A = \left[\frac{1}{3}\frac{Sales(A)}{Sales(group)} + \frac{1}{3}\left(\frac{1}{2}\frac{Payroll(A)}{Payroll(group)} + \frac{1}{2}\frac{No\ of\ employees(A)}{No\ of\ employees(group)}\right) + \frac{1}{3}\frac{Assets(A)}{Assets(group)}\right] x\ CTB$$

There was some controversy on the inclusion of a sales factor. For some experts, sales should be included, regardless whether it is recognized 'at origin' or 'at destination'. For others, sales should be ignored because it is arguable whether 'demand' is an income generating factor. According to the Commission, sales should be included into the formula as firms make profit only insofar as their products/services are sold (EC 2007a; EC 2007b). The factor sales includes 'sales by destination' meaning that "sales of goods shall be included in the sales factor of the group member located in the Member State where dispatch or transport of the goods to the person acquiring them ends" (EC, 2011, Article 96). The inclusion of the traditional production factors labour and capital was not a great subject of discussion, given their direct contribution to the generation of profit. The factor labour

includes for one half the number of employees and for the other half the total amount of the payroll of a group member. The factor assets consists of the average value of all fixed tangible assets owned, rented or leased by a group member. With respect to the asset factor, the following addition was made: "In the five years that follow a taxpayer's entry into an existing or new group, its asset factor shall also include the total amount of costs incurred for research, development, marketing and advertising by the taxpayer over the six years that preceded its entry into the group" (EC, 2011, Article 92(2)).[49] As prescribed in section 2, the current evolution towards a knowledge-based economy implies that intangible capital forms an important and growing share of the total assets of firms. Therefore, only partly including intangible assets into the AF could lead to a misattribution of the CTB among the different MS.

The main purpose of this current research is to test the profit generating capacity of intangible assets for Belgian firms. We define intangible assets as the sum of 'capitalized R&D costs' and 'concessions, patents and licenses'[50] and expect a positive and significant impact of this variable on corporate profits. Further, we control for the proposed apportionment factors but make no prior expectations for these variables. To avoid problems with multicollinearity, we do not include both labour factors, i.e. cost of employees and number of employees, simultaneously into the analyses. Instead, we report two models, including either of the two labour factors. Consequently, the analysis reported in section 5 is based on the following equation which will be estimated by OLS:

$$PL_i = \beta_1 S_i + \beta_2 TFA_i + \beta_3 L + \beta_4 IA_i + \varepsilon_i \quad (1)$$

Predicted sign: . . . +

Where: PL = current profit/loss before taxes (operating + financial profit and loss)

S = sales

TFA = book value of tangible fixed assets

L = labour; i.e. remunerations, social security costs and pensions or number of

[49] In this paper we focus on the exclusion of intangibles in the asset factor, therefore a detailed description of the different apportionment factors is beyond our scope. We refer to Article 86 until Article 103 of the CCCTB proposal (EC, 2011) for more information on the apportionment factors.

[50] We exclude goodwill and advanced payments from the factor intangible assets, as these items are not likely to create profit.

employees

IA = book value of 'R&D expenses' and 'concessions, patents and licenses'

In the current evolution towards a more knowledge-based economy, policy makers as well as academic researchers mainly focus on the importance of R&D investments as part of the total assets (see supra). Therefore, in a further analysis, we are interested in the results of including the capitalized R&D costs separately from 'concessions, patents and licenses'. Consequently, the analysis in section 5 will also include the OLS estimates from the following equation:

$$PL_i = \beta_1 S_i + \beta_2 TFA_i + \beta_3 L + \beta_4 RD_i + \varepsilon_i \quad (2)$$

Predicted sign: . . . +

Where: PL = current profit/loss before taxes (operating + financial profit and loss)

S = sales

TFA = book value of tangible fixed assets

L = labour; i.e. remunerations, social security costs and pensions or number of employees

RD = book value of capitalized R&D expenses

We collect firm-level data for the year 2013 from the Belfirst database, which contains the annual account data of Belgian firms. We select companies that are active in the service or manufacturing sector and defined as SME or large company[51]. Data are collected from the unconsolidated[52] statements. Our sample consists of 5,358 active firms containing complete information on the required variables. Table 1 reports the descriptive statistics for all variables. Profit/loss before tax ranges from € -134,290,000 to € 1,748,957,000 with an average of € 3,962,000. Further, the sample has an average of tangible and intangible assets of € 13,144,000 and € 3,010,000 respectively. The factor labour is represented by an average

[51] In particular, we leave out micro-firms by selecting companies with a minimum turnover of 2 million or minimum total assets of 2 million and minimum number of employees of 10 during the last two available years.

[52] We do not use consolidated statements because these statements do not link the profit of an entity with its allocation factors.

cost of employees of € 9,267,000 and an average number of employees of 142. The average sales equals € 83,656,000 and the average capitalized R&D costs € 1,409,000.

Table 1 Descriptive statistics, 2013

No. of obs. = 5,358	Min.	Max.	Mean	Std. dev.
Profit/loss before tax	-134,290	1,748,957	3,962	43,700
Tangible fixed assets	0	2,108,112	13,144	84,521
Intangible assets	0	4,331,122	3,010	68,237
Labour costs	5	801,381	9,267	31,528
Number of employees	10	15,323	142	502
Sales	0	30,500,000	83,656	694,728
R&D	0	3,498,216	1,409	51,101

All variables are in thousands except for the number of employees.

The correlation matrix is presented in Table 2. All variables are significantly and positively correlated, except for the non-significant correlation between R&D and PL before tax.

Table 2 Correlation matrix

No. of obs. = 5,358	Labour costs	Sales	Profit/loss before tax	Tangible fixed assets	Intangible assets	R&D	No. of empl.
Labour costs	1						
Sales	0.6735***	1					
Profit/loss before tax	0.3058***	0.3867***	1				
Tangible fixed assets	0.436***	0.4678***	0.2017***	1			
Intangible assets	0.3607***	0.5639***	0.1399***	0.2141***	1		
R&D	0.0762***	0.0473***	-0.0111	0.0946***	0.2974***	1	
Number of employees	0.9369***	0.6388***	0.2505***	0.4918***	0.3106***	0.0659***	1

***, **, * indicate significance at the 1, 5 and 10% level respectively.

5 Empirical results and discussion

The estimation results of equation (1) and equation (2) are presented in Table 3 and Table 4 respectively.

Table 3 reports two models which only differ with respect to the included labour factor. At the bottom of the table, the coefficients of determination (R^2) are reported. These coefficients represent the percentage of the variation in profit explained by the variables in the regression (Gujarati, 2009). The best performing formula, i.e. where R^2 is the highest, is the one including cost of employees as a labour factor and adding intangible assets (R^2 = 33.81%). In case of model 1, the regression only including the proposed allocation factors explains about 31,43% of the variation in profit, whereas the regression also including intangible assets explains about 33,81%. For model 2, the explained variation in profit increases from 28.53% to 32.48% when intangible assets are added to the proposed allocation factors. However, a property of R^2 is that it is a non-decreasing function of the number of explanatory variables presented in the model (Gujarati, 2009). Therefore, an increase in R^2 from adding the variable intangible assets to the equation is a natural result. For a more in-depth study, we investigate the incremental R^2, i.e. the increase in R^2 when adding a new independent variable to a regression already containing previously entered variables. For both models in our analysis, the incremental R^2 is significant at the 1% level. This means that the added variable, intangible assets, has a substantial contribution to the explanation of the variation in profits. More specific, adding intangible assets to the proposed allocation factors significantly increases the R^2 with 2.37 and 3.95% points for model 1 and model 2 respectively.

In addition, the importance of the different variables can be indicated by their standardized beta coefficients[53]. Table 3 shows these standardized coefficients with their robust standard errors between brackets. For both models, we find a significant and positive impact of intangible assets on corporate profit. In fact, after the factor sales, intangible assets is the most important factor in explaining the variation in profit. These results are in line with our expectations. Finally, investigating the standardize beta coefficients of both labour factors learns that the cost of employees is better in explaining profit than the number of employees. Namely, of both labour factors, only labour costs reports a significant coefficient.

[53] Standardized beta coefficients can be interpreted as follows: if the independent variable increases by on stander deviation, on average, the depended variable increases by β * standard deviation units (Gujarati, 2009, p.158).

Table 3 Determinants of PL before taxes, adding IA to the proposed factors.

No. of obs. = 5,358	Model 1		Model 2	
Labour costs	0.2222**	0.1570*	.	.
	(0.1365)	(0.1286)		
Number of employees	.	.	0.0791	0.0484
			(4.999)	(4.5465)
Sales	0.4060*	0.4149*	0.4723**	0.4599**
	(0.0148)	(0.0150)	(0.0145)	(0.0146)
Tangible fixed assets	0.0433	0.0367	0.0953	0.0689
	(0.0226)	(0.0220)	(0.0325)	(0.0297)
Intangible assets	.	0.1670***	.	0.2051***
		(0.0190)		(0.0210)
R^2	0.3143***	0.3381***	0.2853***	0.3248***
Incremental R^2		0.0237***		0.0395***

The table represents standardized beta coefficients and robust standard errors between brackets, incremental R^2 from adding IA. ***, **, * indicate significance at the 1, 5 and 10% level respectively.

Analogous to Table 3, Table 4 reports the OLS results from adding the factor R&D to the proposed allocation factors. Again, we report two models, each including one of the two labour factors. For both models, adding R&D significantly increases R^2 with 1.49% points for model 1 and with 2.73% points for model 2. More specific, the explained variation in profit is increased from 31.43% to 32.93% and from 28.53% to 31.27% for model 1 and 2 respectively. Further, the standardized beta coefficients show a significant and positive influence of R&D on corporate profit, irrespective of the labour factor included. Moreover, after the factor sales, R&D contributes the most to the creation of profit. Finally, tangible fixed assets and number of employees do not significantly contribute to the determination of profit, whereas labour costs and sales do. Again, we could state that between both labour factors, cost of employees is the most accurate one.

Table 4 Determinants of PL before taxes, adding R&D to the proposed factors.

No. of obs. = 5,358	Model 1		Model 2	
Labour costs	0.2222**	0.1748*	.	.
	(0.1365)	(0.1365)		
Number of employees	.	.	0.0791	0.0561
			(4.999)	(4.4740)
Sales	0.4060*	0.4169*	0.4723**	0.4684**
	(0.0148)	(0.0150)	(0.0145)	(0.0146)
Tangible fixed assets	0.0433	0.0433	0.0953	0.0812
	(0.0226)	(0.2301)	(0.0325)	(0.0330)
R&D	.	0.1297***	.	0.1683***
		(0.0338)		(0.034)
R^2	0.3143***	0.3293***	0.2853***	0.3127***
Incremental R^2		0.0149***		0.0273***

The table represents standardized beta coefficients and robust standard errors between brackets, incremental R^2 from adding R&D**.** ***, **, * indicate significance at the 1, 5 and 10% level respectively.

We use a Wilcoxon signed rank test to determine which equation, i.e. the equation including intangible assets, the equation including R&D, or the equation excluding both, is more accurate than another. The Wilcoxon signed rank test is a nonparametric test which ranks paired differences between any two observations (Gujarati, 2009). Based on the distribution of the forecast errors (y-hat(y)) relative to the forecast profit (hat(y)), we use this test to assess the equality of matched pairs of observations for each equation. The null hypothesis is that both distributions are the same. If the absolute value of the Wilcoxon Z-statistic is greater than 2.58, we can reject the null hypothesis at the 1% significance level. The Wilcoxon Z-statistics of each pair are reported in Table 5 (panel A). For each pair, the differences are significant at the 1% level. Table 5 (panel B) reports the residual sum of squares (RSS) for each equation. The equation including intangible assets exhibits the lowest degree of RSS and performs significantly better than the other two equations. The equation including R&D performs significantly better than the one ignoring any form of intangible assets.

Table 5 Wilcoxson sign rank test

Panel A: Z-statistics		
Formula	(L, S, TFA)	(L, S, TFA) + IA
(L, S, TFA)	.	
(L, S, TFA) + IA	-11.257	.
(L, S, TFA) + R&D	-12.051	-11.960
Panel B: RSS		
Formula	Residual sum of squares (RSS)	Significantly more accurate than
(L, S, TFA) + IA	6.77E+12	(L, S, TFA) and (L, S, TFA) + R&D
(L, S, TFA) + R&D	6.86E+12	(L, S, TFA)
(L, S, TFA)	7.01E+12	.

6 Conclusion

On 16 March 2011, the European Commission (EC) proposed a council directive for a Common Consolidated Corporate Tax Base (CCCTB) in Europe. This European harmonized tax system would remove all tax obstacles currently harming the international competitiveness of European companies. In short, the new tax system allows European companies to calculate their corporate tax base conform one set of rules. The individual tax bases are then summed up to the consolidated tax base (CTB) on a group level, after which the CTB is reallocation to the different group members, and by consequence to the different Member States (MS). Each MS preserves the right to apply its own tax rate to their specific share of the CTB.

The allocation mechanism forms an essential part of the CCCTB as it introduces most of the advantages coming from this new tax system. At the same time, the revenue consequences for the Member States will highly depend on this allocation mechanism. Therefore, the question “How to share the CTB?” has been a controversial issue in the CCCTB history. The Commission proposes an allocation formula that is based on three equally weighted firm specific factors: sales, labour and assets. However, for reasons of volatility, valuation and location issues, the Commission would only partly include intangible assets into the assets factor. Namely, it is the Commission’s proposal to temporary include in the asset factor of new group members, the previously incurred costs for R&D, marketing and advertising. Nevertheless, given the current evolution towards a more knowledge based economy, intangible assets form a growing and undeniable part of corporates’ total assets. Therefore, ignoring intangible assets could lead to an unfair distribution of the CTB among the different

group entities and by consequence among the different MS. Especially for MS that invest highly in a more knowledge based economy, intangible assets should be included into the EU apportionment formula. Namely, MS that have a higher share of intangible assets compared to other MS, would lose corporate income taxes when intangibles are excluded from the formula. The main purpose of this research is to provide empirical evidence on the importance for Belgium to include intangible assets into the EU apportionment formula.

We collected firm level data from the unconsolidated statements of 5,358 Belgian SME's or large companies and used statistic regression analyses in order to investigate the impact of the different allocation factors on the determination of corporate profit. Our analyses was based on two equations, the first equation includes intangible assets as the sum of capitalized cost of R&D and concessions, patents and licenses, whereas the second equation includes capitalized R&D costs separately. Both equations are compared to the base case where intangible assets are completely ignored. When controlling for the proposed allocation factors, adding intangible assets significantly contributes to the determination of profits. Namely, depending on which labour factor is included (cost or number of employees), the R^2 significantly increases with 2.37 % points (cost of employees) and 3.95 % points (number of employees). The same holds true when adding capitalized R&D costs to the proposed allocation factors. In this case, the R^2 significantly increases with 1.49 % points (number of employees) and 2.73 % points (cost of employees). Further, intangible assets as well as capitalized R&D costs have a significant and positive influence on corporate profit. In fact, after the factor sales, these factors are the most important in explaining profits. A more in depth study of the different formulas indicates that the formula including intangible assets as well as the formula including R&D is significantly more accurate than the formula ignoring intangible assets. In addition, the formula including intangible assets is significantly more accurate than the one including the capitalized cost of R&D separately.

To the best of our knowledge, this is the first empirical study that looks at the profit generating capacity of Belgian intangible assets. Our results confirm our expectation that intangible assets play a major role in explaining corporate profit for Belgian companies. As a consequence, ignoring this factor from the EU apportionment formula could lead to an unfair distribution of the CTB for Belgium. Further research should be directed towards the

location, valuation an mobility issues concerning intangible assets and towards the profit generating capacity of unrecognized intangible assets.

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CHAPTER 4: DID THE ECONOMIC IMPACT OF CCCTB AFFECT THE VOTING BEHAVIOUR OF THE MEPS?*

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Abstract

On 19 April 2012, the European Parliament voted on the European Commission's proposal for a Common Consolidated Corporate Tax Base (CCCTB) Directive. We exploit a unique research setting which was created by an economic impact assessment of CCCTB that was made available to the Members of the European Parliament (MEPs) to support their decision process. Using statistical regression analysis, we investigate if the voting behaviour of MEPs was influenced by the predicted economic impact of CCCTB on their specific country. Our results show that, even after controlling for party, country and individual variables, the economic impact indeed had a significant influence on the voting behaviour of MEPs. In particular, more favourable economic consequences of CCCTB for a country led to a higher chance for MEPs to vote in favour of the CCCTB proposal. To the best of our knowledge, this is the first study which empirically investigates the relationship between the voting behaviour of MEPs and the expected economic impact of measures they decide on.

* A version of this paper is published in ***Economist***, 2015, 163(1).

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1 Introduction

On 16 March 2011, the European Commission (EC) launched a proposal for a Council Directive on a Common Consolidated Corporate Tax Base (CCCTB). According to this proposal, CCCTB would harmonise the rules to calculate the individual tax bases of all group members. The individual bases would then be consolidated and shared among the group members by means of an apportionment formula. Finally, each member state would apply its own tax rate to the overall obtained tax base (EC, 2011a). An important advantage of such harmonization is that it would facilitate the cross-border expansion of companies (EC, 2011a). Together with the proposal for a Council Directive, the EC published an economic impact assessment of the CCCTB (EC, 2011b). Therein, a study of Bettendorf et al. (2009) simulates the economic implications of a CCCTB for each European member state. Among other things, the authors show that on an EU-average, the absolute change of corporate income tax revenues as a share of GDP would equal 0.06%. At the country level, Luxembourg, Malta and Poland would lose the most in terms of their current corporate tax revenues, whereas Belgium, Estonia and Lithuania would be biggest winners (Bettendorf et al., 2009).

On 19 April 2012, the European Parliament (EP) voted on the EC's proposal for a CCCTB. The proposal was approved, but contained several amendments to the Commission's initial text (EP, 2012). The main research question we intend to address is whether or not the voting behaviour of Members of the European Parliament (MEPs) was influenced by the estimated economic impact of CCCTB. Recent studies on voting behaviour of MEPs typically focus on the question whether MEPs vote rather along the European party or country line. Several authors (Faas, 2003; Hix, 2002; Hix & Noury, 2009) stress that MEPs primarily vote along the transnational party lines. However, Aspinwall (2002) shows that fields with strong and heterogeneously defined national interests such as foreign policy, are characterised by a slightly larger national cohesion. Beside party and country variables, also individual characteristics such as gender, experience and political specialization are often considered to have an impact on the voting behaviour of MEPs (Giger, 2009; Heinemann et al., 2009).

After controlling for party, country and individual variables, we find that the economic impact of CCCTB, as assessed by the impact study of Bettendorf et al. (2009) and communicated to the MEPs, does make a difference in the voting behaviour of MEPs. In

particular, a higher positive impact of CCCTB on the CIT revenue, GDP or employment results in a higher chance for MEPs to vote in favour of the CCCTB proposal.

Our research contributes to the existing literature as there is, to the best of our knowledge, no research covering the relationship between the voting behaviour of MEPs and the economic impact of measures they decide on[56]. The existence of an estimate of the overall economic consequences of CCCTB and the fact that this was available to the MEPs on the EC's website, provides a unique research setting.

The paper is organized as follows. Section 2 describes the voting procedure of CCCTB in the EP. The theoretical framework and hypotheses for explaining the MEPs' voting behaviour are given in section 3. The methodology is described in section 4. Section 5 discusses the results and robustness checks. Section 6 concludes.

2 CCCTB voting in European Parliament

In October 2001, the EC published the report 'Company Taxation in the Internal market' in which tax obstacles for companies with EU-wide activities were brought to the attention. Multinationals, for example, face high compliance costs because of the different corporate tax systems that exist across the twenty-eight member states. According to this report, two approaches can be distinguished to tackle these tax obstacles. A first approach would be the application of a wide variety of targeted solutions. Examples are the implementation of the European Merger Directive and the Parent Subsidiary Directive. A second approach would be the introduction of a comprehensive solution. The Commission believes that CCCTB would be such a solution as it addresses all underlying tax obstacles which exist for companies operating in more than one member state (EC, 2001).

In 2004, the EC established a Working Group (WG) with the aim to 'examine and discuss, from a technical perspective, all implementation issues of a common consolidated tax base for companies operating in the EU' (EC, 2004, p. 2). Eventually, on 16 March 2011, the EC launched a proposal for a Council Directive on a Common Consolidated Corporate Tax Base. In a nutshell, the CCCTB implies that each European company could use a common set of rules to calculate its individual taxable profit. These individual tax bases would then be

[56] One of the few examples is the study of Romer and Romer (2008) who find evidence that differences between the Federal Open Market Committee and staff forecasts in the US affect monetary policy choices.

summed up to the consolidated tax base. This consolidation of the tax bases would result in the elimination of intra-group transactions and off-set of losses. Thereafter, the consolidated tax base would be shared among the individual companies according to their proportions in the group's total of labour, sales, and tangible assets, i.e. the apportionment formula. Finally, as the Commission does not have the intention to introduce a harmonised corporate tax rate, each member state would preserve the right to apply its own tax rate to the obtained share of the overall tax base (EC, 2011a).

Immediately after the announcement of the EC's proposal for a CCCTB in March 2011, the proposal was transferred to the European Parliament (EP). According to Article 115 of the Treaty on the functioning of the European Union (TFEU), the consultation procedure applies to decisions concerning direct taxation such as the CCCTB. This 'special legislative' procedure describes the EP's role as a consultative one. The final decision on the adoption of a CCCTB rests with the Council of Ministers of the European Union (EP, 2014). On 19 April 2012, the European Parliament (EP) voted on the EC's proposal for a CCCTB Directive. By simple majority, the proposal was approved with 452 votes in favour, 172 against and 36 abstentions (VoteWatch Europe, 2012). However, the approved resolution contained several amendments to the Commission's initial text (EP, 2012). We mention the most striking ones[57]. First, the EP recommends a mandatory CCCTB for all companies except small and medium-sized enterprises (SMEs)[58], whereas the EC originally proposed an optional system for all companies. The EP would provide a brief transition period of 2 years for companies and cooperatives which operate cross-border and a transition period of 5 years for all other companies except SMEs. Another remarkable amendment of the EP is the introduction of a more strict general anti-abuse rule. In particular, the EP adjusts Article 80 of the proposal by formulating that 'artificial transactions carried out *mainly* for the purpose of avoiding taxation should be ignored for purposes of calculating the tax base' instead of 'artificial transactions carried out for the *sole* purpose of avoiding taxation should be ignored' (EP, 2012, p. 20). A third amendment suggested by the EP deals with the design of the apportionment formula. The EP proposes a formula where sales by destination, labour and assets are weighted at 10%, 45% and 45% respectively, while the EC proposes a sharing formula where these factors are equally weighted. The EP argues that the adjusted formula

[57] For a complete overview we refer to EP (2012).
[58] SME as defined in EU law: EU recommendation 2003/361.

would guarantee that the CCCTB system would not deviate too much from the internationally accepted principle of attributing ultimate taxing rights to the source state. Moreover, it would ensure that companies with limited domestic markets would not be disadvantaged in the apportionment. With respect to the applied tax rates, the EP agrees with the EC that CCCTB should not introduce a harmonised corporate tax rate. However, the EP states that the option of minimum rates should be left open in case it 'becomes apparent that the economic efficiency, effectiveness and equitability of corporate taxation would benefit from an introduction of minimum rates.' Also the introduction of a certain bandwidth would be an option (EP, 2012, p. 10).

3 Explaining CCCTB voting

3.1 Economic impact CCCTB

The key question we intend to address is whether or not the voting behaviour of MEPs was influenced by the economic impact of CCCTB. In the academic literature only a few studies deal with the assessment of the economic impact of this new tax system. A brief overview of their main results is given in the next paragraphs.

Using German FDI data, Fuest et al. (2007) suggest that due to cross border loss-offset the EU wide corporate tax base would shrink significantly under a compulsory system. In particular, overall EU tax revenues would decrease by 22%. Smaller countries, which attract more profits under the current system, would tend to lose a larger part of their tax base than larger countries. The authors, however, inform that their results should be evaluated in the light of the limitations of the data used. The analysis is only based on the data of German outward FDI in the EU15 and the respective German parent companies. Furthermore, behavioural changes by companies as a result from the introduction of CCCTB are not taken into account (Fuest et al., 2007).

Devereux and Loretz (2008) find that overall tax revenues would be likely to drop by 2.5% if companies could choose whether to participate, but increase by more than 2% if companies would be forced to participate. Further, the authors mention that the results are highly dependent on the choice of the apportionment factors, especially for new member states which experience important differences in the share of the labour factor. Devereux and

Loretz (2008) assess the impact of loss consolidation and apportionment, but do not model the possibility of a common tax base. Also, abstraction is made from any behavioural responses by companies.

In 2011, the EC published an impact assessment as an accompanying document to the proposal for a CCCTB Council Directive (EC, 2011b). Therein, the study of Bettendorf et al. (2009) measures the economic impact of a compulsory CCCTB for each country. To quantify the revenue implications of CCCTB, micro data on European countries from the ORBIS database are combined with a computable general equilibrium model, the CORTAX model. This model describes the 27 European member states, the US and Japan. These countries are linked to each other via trade in good markets, international capital markets and multinational firms. As the CORTAX model takes into account behavioural responses, the outcomes of the study should be interpreted as the long-run effects of the CCCTB[59]. The results show that, on an EU-average, the absolute change of corporate tax revenues as a share of GDP would equal 0.06%. At the country level, Luxembourg, Malta and Poland would lose the most in terms of their current corporate tax revenues, whereas Belgium, Estonia and Lithuania would be the biggest winners (Bettendorf et al., 2009).

Also the more recent study of Oestreicher and Koch (2011) assesses the revenue consequences of introducing CCCTB. The analysis is based on a comparative-static (i.e. it abstains from considering behavioural responses) simulation using company micro data from AMADEUS. They find that the total tax revenue of the EU member states would be reduced by 4.56% under a compulsory CCCTB and by 4.5% under an optional CCCTB. Moreover, the revenue effect from implementing a compulsory CCCTB would especially benefit member states with high tax burdens (Oestreicher and Koch, 2011).

If a relationship would exist between the voting behaviour of MEPs and the economic impact of CCCTB, we expect MEPs to act rationally and vote more in favour of CCCTB if they originate from countries with positive revenue effects compared with MEPs from countries with negative revenue effects.

[59] We do not go into the technical details of the model. For a detailed description of the structure and parameterization of the model we refer to Bettendorf and van der Horst (2008).

3.2 Other variables

Party variables

Recent studies on voting behaviour in the EP find that MEPs are subject to party discipline. According to this view, party leaders are able to impose sanctions on MEPs who defect from the European party position. Strong party leaders could enforce this party discipline by controlling leadership positions in the EP like rapporteurships or committee positions and by controlling the legislative agenda and speaking time (Faas 2003; Hix et al. 2005). However, when communicating the party position, party leaders rely on the information provided by committees, rapporteurs, party experts and interest groups (Corbett et al., 2011). In the literature two main ideological dimensions can be distinguished with respect to the position of the party. First, the pro/anti Europe dimension deals with the party's attitude towards European integration. In particular, this dimension concerns the question how fast and far-reaching European integration should go. Centrist parties like the socialist, liberals and conservatives are typically the clearest supporters of integration while left and right parties in Europe are more hesitant to give up national autonomy (Aspinwall, 2002; Hix et al. 2007; Hix and Noury, 2009). Second, a traditional left-right dimension can be distinguished among EU parties as the EU increasingly makes policies in domestic areas such as market regulations, social and environmental policies, interior affairs and justice. In general, left parties favour more strict government regulation whereas right parties oppose it (Aspinwall, 2002; Hix et al. 2007; Hix and Noury, 2009). The relationship between these pro/anti Europe dimension and the left-right dimension is, however, a subject of discussion in the literature. While Hix (1999) considers them as unrelated to each other, Hooghe et al. (2002) and Tsebelis and Garret (2000) state that the integration dimension may be subsumed in the domestic left/right dimension.

Keeping in mind the pro/anti Europe dimension, we expect MEPs from centrist parties to vote more for the CCCTB proposal while we expect other parties to vote more against it. In line with the left-right dimension, we expect MEPs to vote more against CCCTB when their party is closer to the right.

Country variables

Political party leaders in the EP are not the only actors who can enforce voting discipline. The leaders of national delegations also possess sanctioning power as they control the selection of national candidates in EP elections. With respect to European integration, the position of national party leaders is likely to be influenced by the position of its national population. Given this national discipline, MEPs from countries with an EU-sceptical population should be less inclined to give up national autonomy compared to MEPs from countries with a more pro-European attitude (Heinemann et al., 2009; Hix, 2002).

Furthermore, with the 2004 enlargement, the EP became more politically, economically and culturally heterogeneous than before. The ten new member states from Central and Eastern Europe have lower income per capita than most of the original member states, which may go hand in hand with political polarization. One might expect that MEPs from new member states want to keep their autonomy more as they originate from transition countries building up a relative short experience of political autonomy (Heinemann et al., 2009; Hix and Noury, 2009).

Keeping in mind the above argumentation, we expect MEPs from countries with a pro-European attitude to vote more in favour of CCCTB compared with MEPs from countries with an anti-European attitude. Moreover, MEPs from old member states are expected to support CCCTB stronger compared with MEPs from new member states.

Individual variables

Also individual characteristics such as gender, experience and political specialization could have an impact on a MEP's position (Heinemann et al., 2009). According to the literature gender differences exist with respect to voting behaviour. In the 1970s and 1980s women tended to vote more conservatively, while over the last decades women are more left-leaning (Giger, 2009; Jenssen and Bratterud, 1997). On the one hand, left oriented people are rather Eurosceptic, but on the other hand they favour stricter European regulation as Europe is increasingly involved with domestic policies (Giger, 2009; Jenssen and Bratterud, 1997). Keeping this in mind, our expected sign for women voting on CCCTB is rather ambiguous. Experience in the EP could be relevant for the familiarity with EU institutions and may be important for the closeness of participation in Parliament networks and the

assimilation of dominating views (Heineman et al., 2009). Also, MEPs with specific education and specialization could have informative advantages with respect to the topic they decide on (Heineman et al., 2009). However, we do not have particular directional expectations about these effects on the voting behaviour of MEPs with respect to CCCTB.

4 The empirical model and data

In this section, we specify our empirical model in which we test whether the economic impact of CCCTB is reflected in the voting behaviour of MEPs on the amended CCCTB proposal[60]. As it concerns a proposal of a legislative act, the MEPs had to vote by roll-call (EP, 2013, rule 166). This means that the MEPs' vote choices were recorded electronically, which enabled us to identify each vote. To explain the MEPs' voting behaviour, we use the vote choice as dependent variable and estimate the following cross-sectional regression models:

$$Vote\ choice_m = \beta_1\ economic\ impact\ CCCTB_m + \beta_2\ party\ EU_m + \beta_3\ party\ left\text{-}right_m + \beta_4\ new\ MS_m + \beta_5\ country\ EU_m + \beta_6\ gender_m + \beta_7\ age_m + \beta_8\ education_m + \beta_9\ amendments_m + \beta_{10}\ mandate_m + \varepsilon_m \quad (1)$$

In the regression each β is a regression coefficient, ε an error term, and each MEP is indexed by m.

We obtain our dependent variable *'vote choice'* from the independent organization VoteWatch Europe (VoteWatch Europe, 2012). On a total of 754 MEPs, we retain a sample of 654 MEPs who casted their vote on the proposal[61]. Each observation records whether the respective MEP voted 'no' (N=172), abstained from voting (N=34) or voted 'yes' (N=448). In the voting literature, several authors state that this variable should be treated as ordinal (Boockmann and Dreher, 2011; Hosli et al., 2011; Hosli, 2007). Following this approach, we assume that abstentions indicate an aversion, but not to the same extent as voting 'no' does.

[60] We analyse the 'final voting' of the MEPs, i.e. the voting on the amended CCCTB proposal as a whole. Voting results on individual amendments were not available.

[61] We exclude the non-participators (94 obs.) and drop the MEPs from the country Luxembourg (6 obs.). Compared with the other member states, Luxembourg has a disproportional large effect of CCCTB on CIT revenue due to its exceptional large FDI positions vis à vis other countries. For an average EU country, the total sum of the inward and outward stock of FDI is 60% of GDP. The second-largest stock is found in the Netherlands which is 2.4 times its GDP. Luxembourg stands out with a stock of 9.4 times its GDP. (Bettendorf et al., 2009, p. 25). The reported results are not sensitive to including the 6 observations of Luxembourg.

Accordingly, we code 'no' votes as '1', abstentions as '2' and 'yes' votes as '3'. For these 654 roll-call votes we obtain complete information for all explanatory variables:

Economic impact CCCTB

To capture the economic impact of CCCTB (see section 3.1), we consider the simulations in the study by Bettendorf et al. (2009). This choice was motivate by two reasons. First, the Bettendorf study was published by the EC to support MEPs in their decision process. As the other impact studies (see section 3.1) were not commissioned by the EC or not yet published at the time of the EP voting, it seemed less sensible to consider them in our analysis. Second, Bettendorf et al. (2009) simulated different scenarios from which we use the outcome option which takes into account other relevant tax rules as defined in the amended proposal. Namely, we make use of the results given in 'Table C29' of Bettendorf et al. (2009). Using these results makes sense because they are based on a mandatory CCCTB applied for all firms, i.e. both national and multinational firms. Moreover, the results take into account the extended CORTAX model which includes outside tax havens and discrete location choices. Finally, with respect to the common tax base rules, plant and machinery are depreciated at 25% declining balance, as proposed in the amended directive. One shortcoming is that the results are based on a formula assuming equal weights for the factors sales, employment and capital, whereas the weights in the amended proposal equal 10%, 45% and 45% respectively. As the study of Bettendorf et al. (2009) does not include the simulation of the proposed unequal weights for all firms CCCTB, we consider the option equal weights for all firms. Despite the merits of the studies of Fuest et al. (2007) and Devereux and Loretz (2008), these older studies substantially deviate from the amended proposal[62].

One might question whether and to what extent MEPs actually gathered information directly from the Bettendorf study or were informed indirectly by the recommendation given by their party expert or by an external advisor. A less demanding point of view – which is also consistent with our research hypothesis – is that the predicted economic impacts of the Bettendorf paper are well correlated with basic features of the economy and the

[62] For example, Fuest et al. (2007) only take into account German outbound multinationals and therefore ignore that CCCTB would be applied by multinational companies located in all member states.

taxations system. The MEPs have a better knowledge of these basic features and this is what is really captured by the variables we take into account.

In the study of Bettendorf et al. (2009) the effects on income tax revenue, employment and GDP are measured as follows:

- *'Impact CIT revenue'* is the impact of a compulsory CCCTB on the corporate income tax (CIT) revenue for each member state and measures the absolute change in the CIT revenue as a percentage of GDP for each country.
- *'Impact employment'* is the impact of a compulsory CCCTB on employment for each member state and measures the relative change in total employment by firms.
- *'Impact GDP'* is the impact of a compulsory CCCTB on GDP for each member state and measures the relative change in gross domestic product, which comprises the value added from capital, labour and the fixed factor, excluding the added value of intermediate inputs in foreign subsidiaries.

Control variables

In line with our theoretical argumentation in section 3.2, we define the other explanatory variables in our regression as follows:

Party variables:

- The dummy variable *'party EU'* reflects the position of the political party towards European integration as it is defined in the study of Hix and Noury (2009)[63]. The dummy equals one if the MEP's political party is a pro-European party (i.e. centrist party) and is zero otherwise.
- Also in line with Hix and Noury (2009), the variable *'party left-right'* ranks the political parties with 1 being the most left and 7 being the most right party.

[63] According to the study of Hix and Noury (2009), the more pro-European political parties in the seventh European Parliament are the centrist parties 'S&D', 'ALDE/ADLE' and 'EPP' ; the more anti-European parties are the radical left parties 'GUE-NGL' and 'Greens/EFA' and radical right parties 'ECR', 'EFD' and the 'NI'. Party abbreviations: European United Left-Nordic Green Left (GUE-NGL), the Greens-European Free Alliance (Greens/EFA), Progressive Alliance of Socialists and Democrats (S&D), Alliance of Liberals and Democrats for Europe (ALDE/ADLE), European People's Party (EPP), European Conservatives and Reformists (ECR), Europe of Freedom and Democracy (EFD) and the Non-Inscrits or independents (NI).

Country variables:

- The dummy *'new MS'* equals one if the MEP's country was a member of the EU since 2004 and is zero otherwise.
- The variable *'country EU'* is a proxy for the citizens' support for the EU in a particular country. Based on the study of Nogueira and Veiga (2010) we compute a popularity index for each MS that is defined as (a–0.5c–b). To compose this index, we look at the Eurobarometer surveys (EC, 2011c) in which citizens answered the following question: "Generally speaking, do you think that your country's membership to the EU is: a) a good thing, b) a bad thing, c) neither good nor bad" (EC, 2011c).

Individual variables:

- The dummy variable *'gender'* equals one if the MEP is male and zero otherwise.
- To measure for experience *'age'* is calculated as the difference between the voting year 2012 and the year of birth and the dummy *'mandate'* equals one if the MEP has at least two mandates in the EP and zero otherwise.
- The variables *'education'* and *'amendments'* are proxies for specialisation and information advantages with respect to the CCCTB topic. The dummy 'education' equals one if the MEP has an economical or law education and is zero otherwise. The variable *'amendments'* reflects the number of amendments that were submitted by the MEP.

Table 1 presents the descriptive statistics of the variables in the regression. For 'impact CIT revenue', the minimum equals -0.17% for the case of Malta and the maximum equals 0.27% for Belgium. The impact of CCCTB on employment and GDP is the highest in case of Malta, respectively 0.15 and 0.94. The impact on employment and GDP is the lowest for Belgium and Ireland, namely -0.50 and -3.28. From the variable 'party EU' we see that almost three quarters of the MEPs belong to a pro-European party. Further, the mean of the variable 'party left-right' equals 4.22, indicating that most of the MEPs belong to a right political party. Considering the country variables, 'new MS' are in the minority and the popularity index 'country EU' ranges from -0.25 to 0.47. The individual variable 'gender' indicates that our data composes of more male than female MEPs. Looking at the variable 'age', the oldest MEP is 80 years of age whereas the youngest is 25 years old. Further, the mean of 'mandate' is 0.44, indicating that the majority of MEPs carried out only one mandate in the EP. The

variable 'education' shows that 37% of the MEPs has an economical or law education. Finally, on average, MEPs submitted 0.46 amendments. Appendix 1 shows that there are no high correlations found between each of these variables.

Table 1 Descriptive statistics

N = 654	Mean	Std. Dev.	Min	Max
Vote	2.42	0.88	1	3
Impact CIT revenue (in %)	0.06	0.09	-0.17	0.27
Impact employment	-0.06	0.12	-0.50	0.15
Impact GDP	-0.35	0.64	-3.28	0.94
Party EU	0.73	0.44	0	1
Party left-right	4.22	1.50	1	7
New MS	0.28	0.45	0	1
Country EU	0.13	0.19	-0.25	0.47
Gender	0.64	0.48	0	1
Age	53.42	10.51	25	80
Education	0.37	0.48	0	1
Amendments	0.46	5.05	0	86
Mandate	0.44	0.50	0	1

Table 2 illustrates the voting behaviour at the political country and party level respectively. To measure the party and country cohesion we apply the agreement index (AI) of Hix, Noury and Roland (2005). The AI equals one if all members of a country or party vote in the same way and equals zero if their votes are equally divided between the three options. In general, the results show that MEPs vote rather similar within a country and party. However, it is noticeable that not all MEPs vote along the country or party line, which suggests that other variables may be important to determine their voting behaviour.

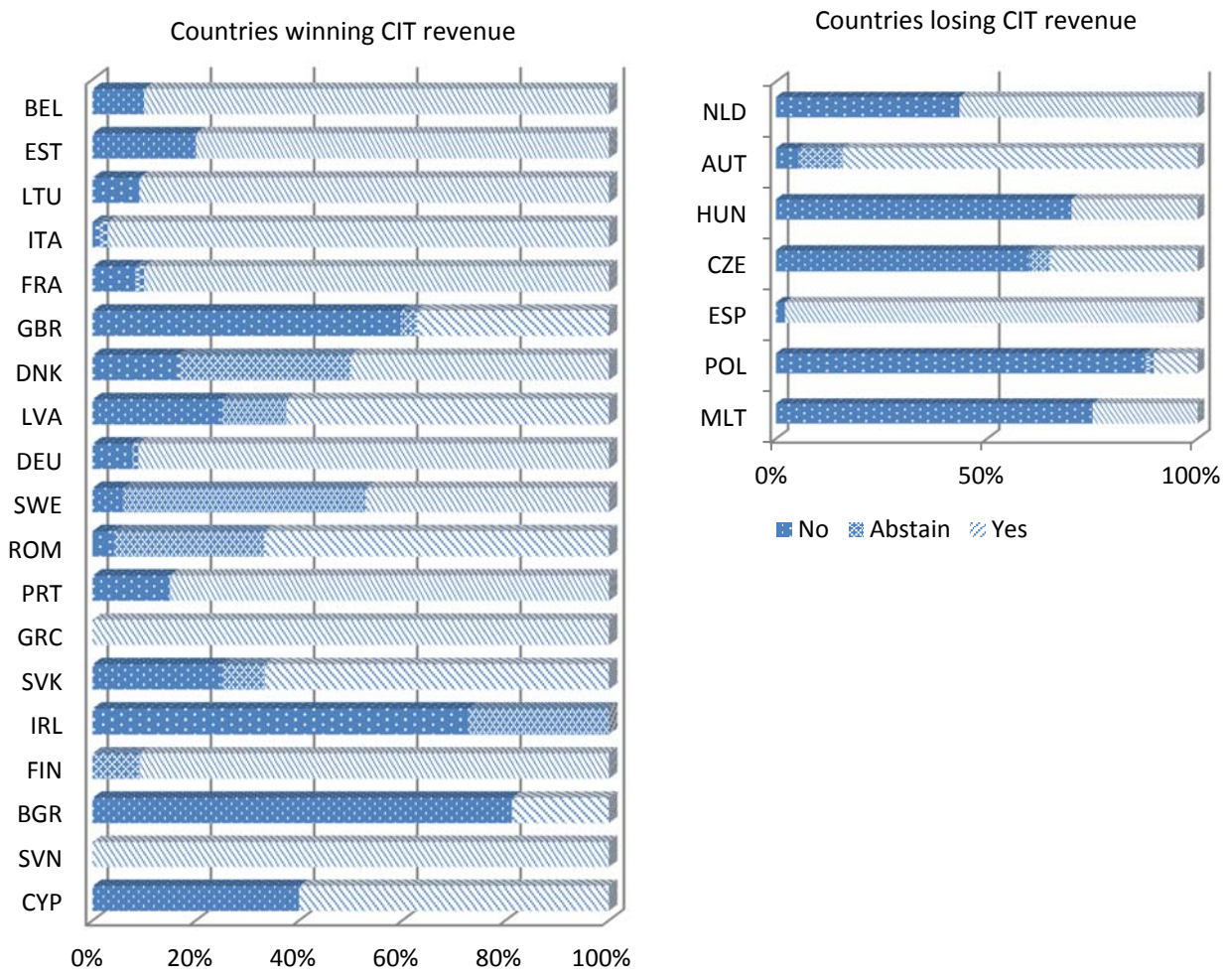
Table 2 Impact and voting results by country and by party

Country level										
	N	Yes	No	Abstain	Impact CIT revenue (%)	Impact employment	Impact GDP	New MS	Country EU	AI of Hix
Austria	19	16	1	2	-0.03	-0.01	-0.52	0	-0.06	0.7632
Belgium	20	18	2	0	0.27	-0.50	0.92	0	0.43	0.8500
Bulgaria	16	3	13	0	0.02	-0.02	-0.71	1	0.19	0.7188
Cyprus	5	3	2	0	0.01	-0.29	-1.49	1	-0.06	0.4000
Czech	20	7	12	1	-0.06	0.07	-0.31	1	-0.12	0.4000
Denmark	12	6	2	4	0.10	-0.13	-0.97	0	0.25	0.2500
Estonia	5	4	1	0	0.21	-0.07	-1.78	1	0.2	0.7000
Finland	11	10	0	1	0.02	-0.06	-0.63	0	0.12	0.8636
France	60	54	5	1	0.12	-0.06	-0.28	0	0.11	0.8500
Germany	90	82	7	1	0.09	-0.02	0.17	0	0.25	0.8667
Greece	14	14	0	0	0.07	-0.05	-0.50	0	-0.09	1.0000
Hungary	20	6	14	0	-0.06	0.02	-0.78	1	-0.12	0.5500
Ireland	11	0	8	3	0.03	-0.28	-3.28	0	0.42	0.5909
Italy	68	66	1	1	0.13	-0.09	-0.15	0	0.06	0.9559
Latvia	8	5	2	1	0.09	-0.10	-0.72	1	-0.22	0.4375
Lithuania	11	10	1	0	0.14	-0.11	-0.83	1	0.18	0.8636
Malta	4	1	3	0	-0.17	0.15	0.94	1	0.06	0.6250
Netherlands	23	13	10	0	-0.03	-0.22	-1.85	0	0.47	0.3478
Poland	48	5	42	1	-0.08	0.07	-0.20	1	0.27	0.8125
Portugal	20	17	3	0	0.08	-0.14	-0.58	0	-0.02	0.7750
Romania	24	16	1	7	0.08	-0.06	-0.68	1	0.32	0.5000
Slovakia	12	8	3	1	0.04	-0.04	-0.86	1	0.24	0.5000
Slovenia	7	7	0	0	0.01	-0.03	-0.29	1	-0.02	1.0000
Spain	47	46	1	0	-0.07	0.14	0.17	0	0.27	0.9681
Sweden	17	8	1	8	0.08	-0.13	-0.49	0	0.27	0.2059
UK	62	23	37	2	0.10	-0.10	-0.12	0	-0.25	0.3952
Total	654	448	172	34						

Party level							
	N	Yes	No	Abstain	Left/right	Pro/anti	AI of Hix
GUE-NGL	26	0	26	0	1	anti	1.0000
Greens/EFA	52	48	2	2	2	anti	0.8846
S&D	163	142	6	15	3	pro	0.8067
ALDE/ADLE	72	63	7	2	4	pro	0.8125
EPP	244	177	55	12	5	pro	0.5881
ECR	46	1	45	0	6	anti	0.9674
EFD	26	12	14	0	7	anti	0.3077
NI	25	5	17	3	7	anti	0.5200
Total	654	448	172	34			

Figure 1 provides a first indication of the possible relationship between the voting outcomes and the assessed economic impact of CCCTB as it separates the voting results for countries losing CIT revenues from countries winning CIT revenues. If the impact of CCCTB affects voting behaviour, we expect winning countries to have proportionally more 'yes' votes than 'no' votes. Most countries confirm this expectation except for Great-Britain, Ireland and Bulgaria. Losing countries, on the other hand, are expected to have proportionally more 'no' votes than 'yes' votes. Countries not corroborating this expectation are the Netherlands, Austria and Spain. However, it is noticeable that the Netherlands still have a substantial amount of 'no' votes.

Figure 1 Voting results by country



5 Estimation results and robustness checks

To investigate the statistical relationship between the voting behaviour of MEPs and the economic impact of CCCTB we estimate equation (1), using an ordered logit regression[64]. As mentioned before, to measure for the economic impact of CCCTB, we took into account the impact on CIT-revenue, GDP and employment. The results are shown in Table 3 (impact CIT-revenue) and Table 4 (impact employment and GDP).

Table 3 includes three models which only differ with respect to the included party variables. As mentioned above, some authors consider the pro/anti Europe dimension and the left-right party dimension as unrelated to each other, while others state that the pro/anti dimension is subsumed in the left-right dimension (Hix, 1999; Hooghe et al., 2002; Tsebelis and Garret, 2000). In our sample the correlation between 'party EU' and 'party left-right' equals -0.0863, suggesting that both variables could have an impact on the voting behaviour. To take all possibilities into account, model 1 includes both party variables 'party EU' and 'party left-right' whereas model 2 and model 3 include either of the two.

For each model, the first column presents the coefficient estimates of the ordered logit regression. In line with our hypothesis in section 3, we use a one-sided test for the CIT revenue variable as there is a clear and straightforward directional expectation. For the same reason, we use one-sided tests for the other variables, except for 'gender', 'age', 'education', 'amendments' and 'mandate'. As mentioned above, our dependent variable has three possible outcomes, ranging from voting against the CCCTB proposal, to abstain from voting, to voting in favour of the proposal. Hence, a positive coefficient implies that the probability of voting in favour increases when the value of the respective independent variable increases. As the size of the ordered logit coefficients is difficult to interpret, the second column presents the average marginal effects. These marginal effects can be calculated for each different voting outcome, we report the effects for the outcome 'yes'[65]. So, the average marginal effects show the change in the probability that outcome 'yes' will be chosen if the explanatory variable increases by one unit[66].

[64] Ordered logit is used because the dependent variable in our study ('vote choice') has three possible values that have an ordered structure.
[65] We report the marginal effects for the answer category with the largest frequency, namely voting 'yes'.
[66] For dummies, the average marginal effects are calculated for a switch from 0 to 1.

Our variable of interest 'impact CIT revenue' is significant and positive in each of the three models. A higher impact of CCCTB on the CIT revenue increases the likelihood of the MEP to vote in favour of the CCCTB proposal. This evidence answers our main research question and indicates that the economic impact of CCCTB on CIT revenue did have an influence on MEPs' voting behaviour. The average marginal effect of 'impact CIT revenue' on the probability of a positive outcome is 0.942.

Also, the two party variables have a significant influence on the vote outcome, no regard to whether they are included separately or jointly. The variable 'party EU', reflecting the party's attitude towards European integration, has a positive effect on the voting behaviour. In line with our expectations, MEPs belonging to pro-European political parties are more likely to vote in favour of the proposal. Moreover, MEPs belonging to parties with a higher score on the left-right party scale, i.e. right oriented parties, are less likely to vote in favour of the proposal.

Further, we find a significant and negative relationship between the dummy variable 'new MS' and the voting behaviour. The negative sign indicates that MEPs originating from countries that entered the EU since 2004 are less likely to vote in favour of the CCCTB proposal. This finding is in line with the a priori made expectation, namely that MEPs from new member states are rather critical of any measures limiting their countries' tax autonomy.

Interestingly, for the variable 'amendments' we find a significant and negative coefficient, indicating that MEPs who submitted more amendments are more likely to vote against the proposal. We did not make any expectation, but a possible explanation could be that the more amendments a MEP submitted, the more he or she is critical about the CCCTB proposal.

Finally, the significance level of the variables 'gender' and 'country EU' is not robust for the three different models. Therefore, the influence of these variables on the voting behaviour of MEPs is rather unsure. Moreover, the age of the MEPs, their number of mandates and whether they have an economic or law degree, do not seem to make any difference in their voting behaviour.

Table 3 Ordered logit with impact CIT revenue, vote choice as dependent variable

	Expected sign	Model 1		Model 2		Model 3	
		Coef.	M.E.	Coef.	M.E.	Coef.	M.E.
Impact CIT	(+)	7.104***	0.942***	6.027***	1.011***	7.149***	0.986***
		(1.304)	(0.167)	(1.125)	(0.178)	(1.351)	(0.178)
Party EU	(+)	2.855***	0.379***	.	.	2.790***	0.385***
		(0.289)	(0.028)			(0.263)	(0.026)
Party left-right	(-)	-0.294***	-0.039***	-0.339***	-0.057***	.	.
		(0.082)	(0.010)	(0.095)	(0.014)		
New MS	(-)	-1.915***	-0.254***	-1.207***	-0.202***	-1.944***	-0.268***
		(0.251)	(0.027)	(0.198)	(0.029)	(0.252)	(0.029)
Country EU	(+)	-0.192	-0.025	1.278***	0.214***	0.354	0.049
		(0.569)	(0.076)	(0.549)	(0.090)	(0.560)	(0.076)
Gender	.	-0.210	-0.028	-0.409**	-0.069**	-0.380*	-0.052*
		(0.224)	(0.030)	(0.206)	(0.034)	(0.227)	(0.031)
Age	.	0.008	0.001	0.015	0.002	0.009	0.001
		(0.011)	(0.001)	(0.009)	(0.002)	(0.010)	(0.001)
Education	.	0.020	0.003	0.298	0.050	-0.110	-0.015
		(0.222)	(0.030)	(0.190)	(0.032)	(0.217)	(0.030)
Amendments	.	-0.052***	-0.007***	-0.048***	-0.008***	-0.045**	-0.006**
		(0.020)	(0.003)	(0.017)	(0.003)	(0.019)	(0.003)
Mandate	.	-0.222	-0.029	-0.054	-0.009	-0.279	-0.038
		(0.232)	(0.031)	(0.195)	(0.033)	(0.231)	(0.032)
Wald Chi^2		158.61***		116.06***		170.14***	
Number of obs.		654		654		654	
Pseudo R^2		0.2968		0.1586		0.2777	

Heteroskedasticity-robust standard errors are reported in parentheses. Average marginal effects are calculated for outcome class 3 (voting yes) . One-sided tests are used for all variables except for 'age', 'gender', 'mandate', 'amendments' and 'education'. ***significant at .01; **significant at .05; * significant at .1.

Table 4 reports the analysis of voting behaviour including the impact of CCCTB on employment and on GDP for model 2 (i.e. including 'party left-right' as party variable)[67]. We find a positive and significant relation between 'vote choice' and 'impact employment', meaning that a higher impact of CCCTB on employment increases the likelihood of the MEP to vote in favour of the proposal. The same holds true for the impact of CCCTB on GDP. With respect to the other explanatory variables, we find similar results as in Table 3. Namely, we

[67] We repeat the same analysis for model 1 and model 3 and find a positive and significant effect (at the 1% level) in the case of 'impact GDP'. For 'impact employment', we find a positive and significant effect (at the 1% level) for model 1 and a less significant but still positive effect for model 3.

find a significant impact of the party variable and country variables, with the a priori expected sign.

Table 4 Ordered logit with impact employment and GDP, vote choice as dependent variable

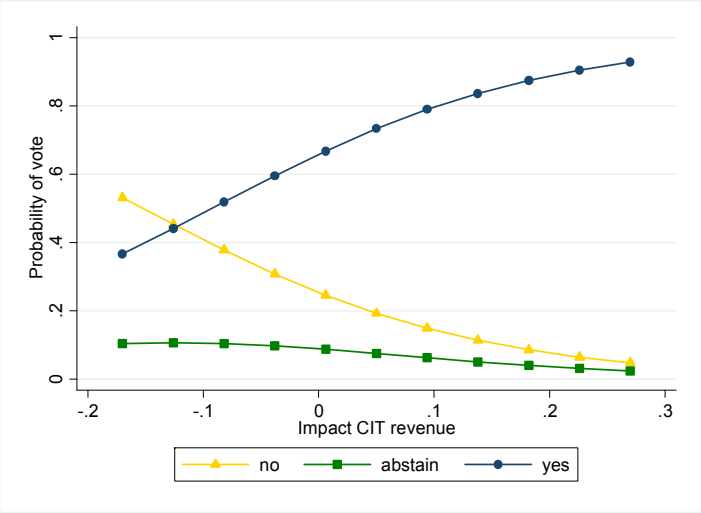
	Expected sign	Impact employment		Impact GDP	
		Coef.	M.E.	Coef.	M.E.
Impact employment	(+)	1.941***	0.336***	.	.
		(0.814)	(0.142)		
Impact GDP	(+)	.	.	0.844***	0.140***
				(0.149)	(0.022)
Party left-right	(-)	-0.348***	-0.060***	-0.358***	-0.059***
		(0.093)	(0.014)	(0.093)	(0.014)
New MS	(-)	-1.776***	-0.308***	-1.491***	-0.247***
		(0.206)	(0.029)	(0.200)	(0.028)
Country EU	(+)	1.236***	0.214***	1.710***	0.283***
		(0.520)	(0.088)	(0.537)	(0.086)
Gender	.	-0.439**	-0.076**	-0.550***	-0.091***
		(0.206)	(0.036)	(0.215)	(0.035)
Age	.	0.017*	0.003*	0.020**	0.003**
		(0.009)	(0.002)	(0.010)	(0.002)
Education	.	0.148	0.026	0.144	0.024
		(0.186)	(0.032)	(0.190)	(0.031)
Amendments	.	-0.045**	-0.008**	-0.049***	-0.008***
		(0.018)	(0.003)	(0.019)	(0.003)
Mandate	.	-0.050	-0.009	-0.153	-0.025
		(0.191)	(0.033)	(0.200)	(0.033)
Wald Chi^2		97.92***		100.54***	
Number of obs.		654		654	
Pseudo R^2		0.1398		0.1666	

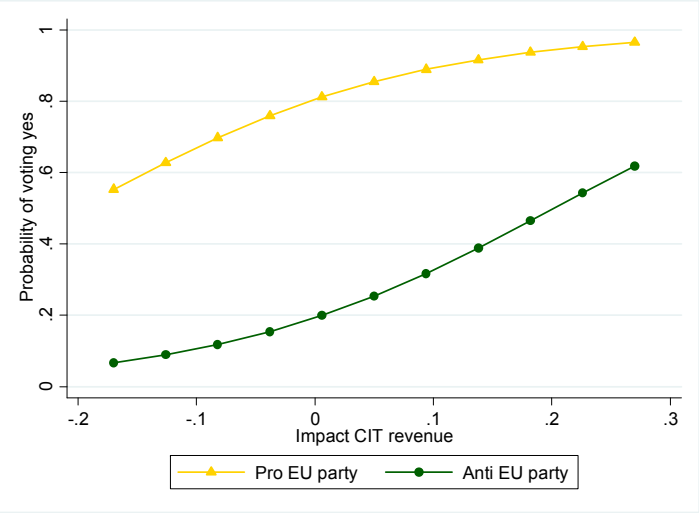
Heteroskedasticity-robust standard errors are reported in parentheses. Average marginal effects are calculated for outcome class 3 (voting yes) . One-sided tests are used for all variables except for 'age', 'gender', 'mandate', 'amendments' and 'education'. ***significant at .01; **significant at .05; * significant at .1.

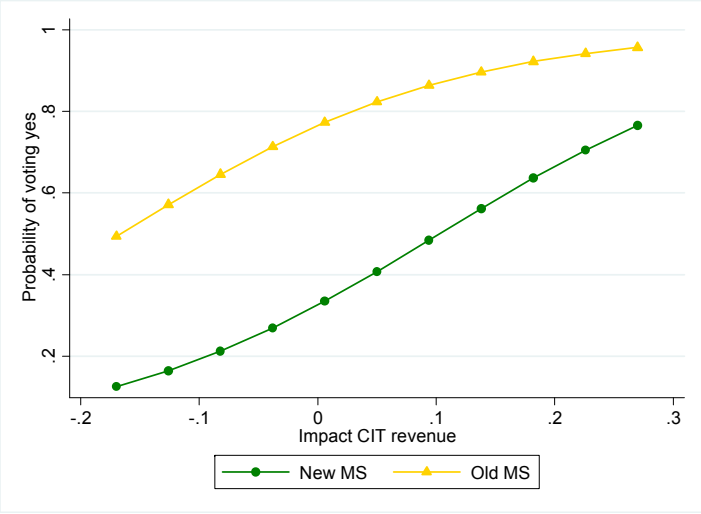
In Figure 2 we graphically demonstrate the effects of the most significant independent variables, namely 'impact CIT revenue', 'party EU', 'party left-right' and 'new MS'. The upper left hand of Figure 2 shows how the impact of CCCTB on CIT revenue affects the vote choice of the MEPs. Based on the results given in Table 2, we calculate the expected probabilities for voting 'yes' or 'no' or 'abstain' from voting. Therefore, all independent variables are set

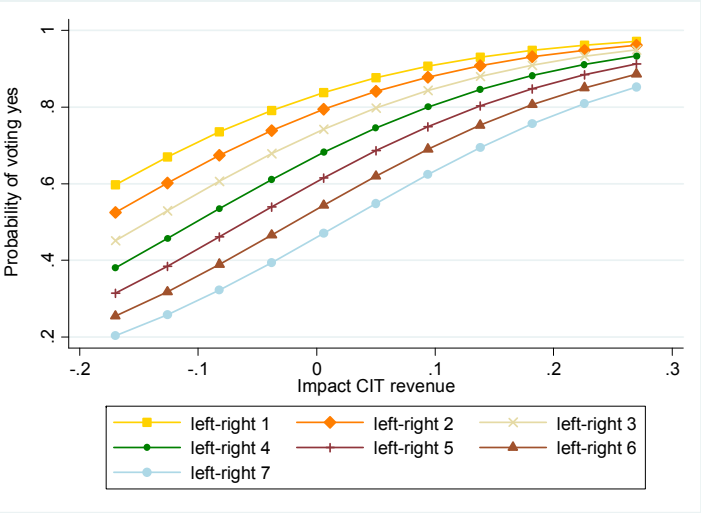
to their mean values except for the variable 'impact CIT revenue', which we allow to vary between its minimum and maximum value. As expected, we find an increasing line for voting 'yes' and a decreasing line for voting 'no'. As the MEPs who 'abstain' from voting seem to be indifferent to the impact on CIT revenue (almost flat line), the probabilities of voting 'yes' and voting 'no' are almost the exact opposites. The upper right hand of figure 2 shows the effect of impact CIT revenue on the expected probability of voting in favour of the proposal. In this analysis, we make a distinction between MEPs belonging to pro-European parties versus MEPs belonging to anti-European parties. As expected, for each value of impact CIT revenue, the probability of voting in favour is higher for MEPs belonging to a pro-EU party. In addition, both lines show a positive relationship between the probability of voting in favour and the impact CIT revenue. However, the influence of an increase in 'impact CIT revenue' on the probability of voting 'yes' is higher for MEPs from anti-EU parties than for MEPs from pro-EU parties. The lower left hand of Figure 2 shows the same analysis but distinguishes between MEPs that are resident in new versus old member states. It is clearly shown that MEPs form new member states are more sceptic about the new tax system as their probability of voting 'yes' is lower for each value of 'impact CIT revenue'. As expected, both lines show a positive relationship but MEPs from new MS are more influenced by an increase in 'impact CIT revenue'. The lower right hand of Figure 2 shows that the probability to vote 'yes' is higher for members from left oriented parties. Moreover, for higher scores of impact CIT revenue, the left-right orientation of the MEP's political party has less influence on the probability to vote in favour. In general, the slopes in Figure 2 are determined by the positive coefficient of 'impact CIT revenue' which is common to all subdivisions.

Figure 2 Probabilities of MEPs' voting outcomes on the CCCTB proposal









In the analyses above, our dependent variable has three outcomes assuming that abstentions indicate an aversion, but not to the same extent as voting 'no' does. However, in the voting literature, some authors disagree and use a binary empirical model stating that voters do not make a difference between voting against and abstain from voting (Mattila, 2004; Volgy et al., 2003; Voeten, 2000). By applying a Wald test, we test whether 'no' and 'abstentions' are different categories[68]. The Wald test of the binary versus the ordered logit rejects the former at very high levels of significance. Therefore, we conclude that a binary logit is inappropriate for our analysis.

Following the reasoning of Boockmann and Dreher (2011), Hosli et al. (2011) and Hosli (2007), we treated our dependent variable as ordered. However, some authors (Doyle, 2004; Lyons, 2007; Tucker et al. 2002) prefer the multinomial technique above the ordered technique, stating that vote choice is unordered. Therefore, as a robustness check, we repeat the same analysis using a multinomial logit (MNL) regression. This multinomial technique requires that one of the vote choices is designated as the base category. In our analysis, we interpret the coefficient estimates in relation to the voting outcome 'no'. The results are shown in Table 5. The first column presents the coefficient estimates for the probability of voting 'yes' relative to voting 'no'. Similarly, the third column reports the coefficient estimates of choosing 'abstain' compared to voting 'no'. The coefficients of a multinomial regression indicate how the logarithmized probability of choosing 'no' changes if the explanatory variable increases with one unit[69]. As the size of these coefficients is difficult to interpret, we also report the average marginal effects.

In order to analyse the effects of the different explanatory variables on the MEPs' vote choices, one has to consider both sets of results jointly. Similarly to the results obtained from the ordered regression, we find a significant and positive effect of 'impact CIT revenue'. Hence, MEPs with a higher impact of CCCTB on their country's CIT revenue are more likely to vote in favour or to abstain from voting. Otherwise said, the option of voting against the proposal is less likely when the impact of CCCTB on CIT revenue increases. Looking at the average marginal effects, the impact of an increase in 'impact CIT revenue' is higher for

[68] In the ordered logit regression, the decision to vote yes, abstain or no depends on an unobservable utility index and it is assumed that MEPs choose a certain outcome when a threshold level or 'cut-point' of the utility index is exceeded. In case of three outcomes, the Wald test checks if the two cut-points are equal or not. If they are equal, the middle category of abstentions can be eliminated. (Verbeek, 2008, p. 202).

[69] For dummy variables the change in probability is shown for a change from 0 to 1.

voting in favour than for abstain from voting. Another significant and positive effect can be found for the variable reflecting the MEP's party position towards European integration. Namely, MEPs from pro-EU parties are more likely to vote in favour or abstain from voting. Further, a higher score on the left-right party scale decreases the likelihood of a MEP to vote in favour of the proposal or abstain from voting. Finally, we also find a significant and negative effect of 'new MS' indicating that MEPs who are resident in new MS countries are more likely to vote against the proposal. As these results are very similar to the results from using an ordered logit, this increases the robustness of our findings.

Table 5 Multinomial logit, vote choice as dependent variable

Base: Vote No	Expected sign	Vote Yes		Abstain	
		Coef.	M.E.	Coef.	M.E.
Impact CIT revenue	(+)	9.378***	0.900***	9.113***	0.079
		(1.781)	(0.172)***	(2.222)	(0.067)
Party EU	(+)	3.579***	0.354***	3.202***	0.017
		(0.382)	(0.037)	(0.733)	(0.027)
Party left-right	(-)	-0.324***	-0.034***	-0.248*	0.001
		(0.093)	(0.011)	(0.191)	(0.008)
New MS	(-)	-2.363***	-0.260***	-1.446***	0.021
		(0.347)	(0.033)	(0.482)	(0.017)
Country EU	(+)	-0.022	-0.080	2.000*	0.010**
		(0.683)	(0.084)	(1.294)	(0.058)
Gender	.	-0.265	-0.029	-0.161	0.002
		(0.256)	(0.029)	(0.417)	(0.017)
Age	.	0.007	0.001	-0.003	-0.000
		(0.012)	(0.001)	(0.022)	(0.001)
Education	.	-0.101	0.001	-0.366	-0.014
		(0.266)	(0.030)	(0.452)	(0.186)
Amendments	.	-0.060**	-0.007**	-0.023	0.001
		(0.023)	(0.003)	(0.015)	(0.001)
Mandate	.	-0.145	-0.026	0.174	0.014
		(0.269)	(0.032)	(0.463)	(0.020)
Constant		0.472		-2.280*	
		(0.803)		(1.332)	
Wald Chi^2		131.79***			
Number of obs.		654			
Pseudo R^2		0.3302			

Heteroskedasticity-robust standard errors are reported in parentheses. One-sided tests are used for all variables except for 'age', 'gender', 'mandate', 'amendments' and 'education'. ***significant at .01; **significant at .05; * significant at .1.

To measure for the economic impact of CCCTB we focus on the results of Bettendorf et al. (2009) as this study was published together with the EC's CCCTB proposal to support the further decision process. However, one might argue that studies prepared by the large tax consultants, even when not commissioned by the EC, might have been more influential. Therefore, as a second robustness check, we include the impact of CCCTB on corporate income tax revenues as reported by a study of Ernst & Young which was commissioned by the Irish Department of Finance (Robert et al., 2011)[70]. The results are shown in Table 6. Again, we find a positive and significant relation between the impact of CCCTB on CIT revenue and the voting behaviour of MEPs. Moreover, we find robust results for the other explanatory variables as well. These findings support our previous finding that the voting behaviour of MEPs was influenced by the economic impact of CCCTB.

Table 6 Ordered logit with impact CIT-revenue (E&Y), vote choice as dependent variable

	Expected sign	Impact CIT revenue (E&Y)	
		Coef.	M.E.
Impact CIT-revenue	(+)	13.677***	2.277***
		(3.329)	(0.536)
Party left-right	(-)	-0.390***	-0.065***
		(0.098)	(0.014)
New MS	(-)	-1.740***	-0.290***
		(2.205)	(0.026)
Country EU	(+)	2.283***	0.380***
		(0.600)	(0.095)
Gender	.	-0.312*	-0.052*
		(0.207)	(0.036)
Age	.	0.010	0.002
		(0.010)	(0.002)
Education	.	0.195	0.032
		(0.191)	(0.032)
Amendments	.	-0.048***	-0.008***
		(0.015)	(0.002)
Mandate	.	0.076	0.0126
		(0.202)	(0.034)
Wald Chi^2	106.19***		
Number of obs.	638		
Pseudo R^2	0.1635		

Heteroskedasticity-robust standard errors are reported in parentheses. Average marginal effects are calculated for voting yes. ***significant at .01; **significant at .05; * significant at .1.

[70] The study of E&Y does not include results for Malta, Cyprus and Slovenia, dropping the MEPs from these results in a total number of observations of 638.

6 Conclusion

On 16 March 2011, the European Commission (EC) launched its long-expected proposal for a Common Consolidated Corporate Tax Base (CCCTB) Directive. This new tax system has the intention to remove all tax obstacles currently harming the international competitiveness of European companies. Together with the CCCTB proposal, an economic impact assessment was published on the EC's website. About one year later, on 19 April 2012, the Members of the European Parliament (MEPs) casted their votes on the EC's proposal for a CCCTB Directive. By simple majority, the European Parliament (EP) approved the proposal after adding several amendments to the initial text.

In this paper we use statistic regression analysis to investigate if the voting behaviour of MEPs was influenced by the economic impact of CCCTB. The economic impact of CCCTB is measured by the impact on CIT-revenue, labour and GDP for each member state. Further, we control for party and country variables as well as for the individual characteristics of MEPs. Our results indicate that the economic impact of CCCTB had a positive significant effect on the voting behaviour. In particular, the higher the impact of CCCTB on CIT revenue, the more chance a MEP voted positively on the CCCTB proposal. In line with previous literature, also the party position and country position had a significant impact on the voting behaviour of MEPs. Namely, MEPs belonging to pro-European political parties and left oriented parties voted significantly more in favour of the proposal than MEPs belonging to anti-European parties and right parties. As regards the country position, MEPs from new member states voted significantly more against the proposal than MEPs from old member states. The individual characteristics of MEPs did not seem to influence the vote choice.

We make an important contribution to the literature by covering the relationship between the voting behaviour of MEPs and the economic impact of the measure they decide on. The existence of the overall revenue consequences of CCCTB and the fact that these were available to the MEPs provided a unique research setting. Unfortunately, we were not able to analyse the EP voting on the individual amendments of the CCCTB proposal as only the voting results on the amended text as a whole were available. In general, we believe that these results can give an indication for the coming decision process in the Council of the European Union. If the revenue consequences of CCCTB will play an important role, we expect it will be difficult to get the proposal unanimously adopted by the Council. An

enhanced co-operation procedure under which a minimum of nine member states would adopt CCCTB would be a more feasible option. Simulating this option with the CORTAX model, Bettendorf et al. (2010) suggest that a coalition of similar countries in terms of the size of their multinational sector would be most successful in reaching an agreement. The further development of CCCTB would be an interesting topic for future research.

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Appendix 1 Correlation matrix

No of obs. = 654	Vote choice	Impact CIT revenue	Impact employment	Impact GDP	Party EU	Party left-right	New MS	Country EU	Gender	Age	Education	Amendments	Mandate
Vote choice	1.000												
Impact CIT revenue	0.3081	1.0000											
Impact employment	0.0404	-0.6224	1.0000										
Impact GDP	0.2029	0.1968	0.2829	1.0000									
Party EU	0.4268	-0.0436	0.1209	0.0063	1.0000								
Party left-right	-0.3000	-0.0586	0.0554	-0.0052	-0.0863	1.0000							
New MS	-0.3671	-0.4463	0.3388	-0.4349	0.0554	0.1309	1.0000						
Country EU	0.0558	-0.2671	0.1176	0.0898	0.1625	-0.1043	0.0064	1.0000					
Gender	-0.1233	-0.0096	0.0367	0.0478	-0.0783	0.1830	0.0477	-0.0482	1.0000				
Age	0.0892	0.1310	-0.0316	0.0913	0.0685	-0.0277	-0.0941	-0.1028	0.1404	1.0000			
Education	-0.0067	-0.1066	0.1146	0.0201	0.1002	0.1496	0.0221	0.0405	0.0614	-0.0845	1.0000		
Amendments	-0.0651	-0.0198	-0.0234	-0.0428	0.0333	0.0094	0.0278	0.0462	0.0219	-0.0586	0.0336	1.0000	
Mandate	0.0271	0.0238	0.0093	0.1355	0.0876	0.0452	-0.0539	-0.0300	0.0719	0.3024	0.0271	-0.0883	1.0000

CHAPTER 5: GENERAL CONCLUSION

In March 2011, the European Commission (EC) published the long expected proposal for a Common Consolidated Corporate Tax Base (CCCTB). In short, the proposal includes, (i) a common set of tax rules to determine the consolidated tax base (CTB) on a group level and (ii) an apportionment formula to reallocate the CTB to the different group members. It does not include a harmonized tax rate as it is the Commission's intention to preserve a fair tax competition (EC, 2011). This dissertation compiles three papers related to the EC's proposal. In the first two papers, we focus on the vexed question of sharing the CTB among the different group members and by consequence among the different Member States. More specifically, the first paper brings into focus the design of the allocation formula and its impact on factor shifting, whereas the second paper concentrates on the importance for Belgium to include intangible assets into the European formula. In the last paper, we focus on the motives for Members of the European Parliament (MEPs) to vote in favour or against the CCCTB proposal.

In this last chapter, we first discuss our main findings and highlight the main conclusions. Next, we reflect on the practical implications of this dissertation. Further, we consider the limitations and suggest some avenues for additional research. We end this dissertation with the latest developments on CCCTB.

1 Main findings

European tax harmonization would reduce tax distortions such as high compliance costs and aggressive tax planning opportunities. An important component therein is the consolidation of the individual tax bases. Namely, adding the individual tax bases implies an automatic cross border loss-offset between different group members and makes transfer pricing systems superfluous. However, the consolidation aspect introduces the need for an apportionment system, which could reintroduce some tax distortions. In our first paper we

used simulation techniques to investigate the design of the apportionment formula in relation to two possible tax distortions.

Firstly, the need to comply with the proposed apportionment formula, i.e. applying the factor definitions as prescribed, could cause high compliance costs. In this respect, we investigated the effect of using more simplified factor definitions on the allocation of the CTB and on the global corporate tax rate (GCTR)[71]. Simplifying the assets factor, while keeping the others as defined by the EC, leads to an increase of the GCTR of 0.03%. Simplifying only the factors of labour or sales results in a decrease of GCTR by 0.07% and an increase by 0.4% respectively. Our results show minor impacts on GNTR of simplifying the factors of assets and labour but a somewhat higher impact of simplifying the sales factor. The sales factor was simplified by using a pure throw back rule in case of nowhere sales instead of a spread throw back rule. This transforms the sales by destination factor into a more origin-based factor which would disturb the balance between the supply and demand side of the profit generating factors. Therefore, we are not in favour of simplifying this factor. However, to solve the remaining problem of complexity, it could be helpful to give multinational groups a software tool which enables them to apply the sales by destination without great efforts.

> ***Statement 1.*** *To avoid high compliance costs, factor definitions should be kept simple and multinationals should be provided with a computer based tool enabling them to apply the sales by destination without great effort.*

Secondly, the use of an apportionment formula could reintroduce tax planning opportunities. Namely, multinationals could reduce their overall corporate tax cost by moving their apportionment factors to group entities that are located in Member States applying low corporate tax rates. In this context, we investigated the impact of the number of factors and the weights given to each factor on the intention of multinationals to shift factors from one entity to another. Our simulations show that when more factors are included, the CTB is shared more equally among the different group members. In this case, the reallocation of one unit of a factor will shift less than one unit of the CTB. Therefore, a more equally distributed CTB, as a result of including more allocation factors, will reduce the

[71] We were able to apply the factor definitions as proposed by the EC, due to the availability of unpublished data of a European multinational.

incentive to shift allocation factors from Member States that apply higher corporate tax rates to those that apply lower corporate tax rates. The same holds true for the factor weights. Namely, applying more equal weights leads to a more equal distribution of the CTB and by consequence, reduces the incentives to reallocate allocation factors.

> ***Statement 2.*** *An efficient formula, i.e. a formula not causing any behaviour distortions, should include more allocation factors and apply equal weights.*

The design of the apportionment formula is not only the concern of European multinationals, but also of European member states. Whereas multinationals will try to minimize their taxes payable, member states will try to protect their tax revenues. Next to an efficient formula, i.e. a formula that is simple to use and difficult to manipulate, the EC meant to propose an equitable formula, i.e. a formula that leads to a fair distribution of CTB among the different entities. To achieve a fair distribution of the CTB, the allocation formula should include factors that represent the profit generating capacity of companies as closely as possible (Agundez-Garcia, 2006). In this context the inclusion of intangible assets into the asset factors has been widely discussed. Including intangible assets seems rather obvious, as they form an important and growing share of the total companies' assets (Hellerstein & McLure, 2004; Hellerstein, 2005). However, due to valuation and location problems and given the volatility of the factor, the EC has decided to include intangibles only partly into the formula. In our second research, we empirically investigated the importance for Belgium of including intangible assets into the EU apportionment formula and presented the following findings.

Firstly, our results show that intangible assets, defined as the sum of capitalized costs of R&D and concessions, patents and licenses, contribute to a great extent to the creation of corporate profit in Belgium. Namely, we find a significant and positive coefficient for the factor intangible assets while controlling for the proposed allocation factors, tangible assets, sales and labour. Comparing the standardized beta coefficients shows that after the sales factor, intangible assets contributes the most to the creation of profit.

Secondly, the current evolution towards a more knowledge-based economy makes intangible assets, and especially investments in R&D, an undeniable part of the companies' total assets. In the Europe 2020 strategy, the EC focusses on the importance of R&D investments to achieve a smart, sustainable and inclusive growth in Europe (EC, 2010). Given the focus on R&D investment, we investigate the impact on corporate profit of capitalized R&D separately. We find a significant and positive contribution of capitalized R&D to profit.

Thirdly, focussing on the formula with or without intangible assets, we could state that both a formula including intangible assets as well as a formula including capitalized R&D investments are significantly more accurate than a formula excluding intangible assets.

Finally, we can conclude that in the light of a fair allocation formula for Belgium, the formula should include intangible assets and especially R&D investments. Leaving out this factor will lead to an unfair distribution of the CTB for member states that invest in a more knowledge-based economy.

> ***Statement 3.*** *For Belgium, a fair apportionment formula should include intangible assets.*

The pressing question is whether the CCCTB will stay a European dream or whether it will become reality. This final decision on this ambitious project rests with the Council of Ministers of the EU, who should adopt the proposal unanimously to put it into practice (EP, 2014). Before this final decision is made, the European Parliament plays an consultative role, i.e. they can make amendments and get to vote on the amended proposal. These votes were cast on 19 April 2012 and the proposal was approved by simple majority with 452 votes in favour and 172 votes against (VoteWatch Europe, 2012). In the light of the coming decision in the Council, we were interested in the motives behind the MEPs' voting behaviour concerning CCCTB. In particular, we wondered if the MEPs' voting behaviour was influenced by the economic impact of CCCTB for their Member State. We used statistic regression techniques and found a significant and positive relationship between the economic impact of CCCTB and the intention to vote in favour of the proposal. In particular, the higher the impact of CCCTB on CIT-revenue, employment and GDP in a Member State, the higher the chance that a MEP from that Member State votes in favour of the CCCTB proposal. We

controlled for country, party and individual variables and in line with previous literature, we find that also party as well as country variables have a significant influence on the MEPs' voting behaviour. Namely, MEPs belonging to pro-European political parties and left oriented parties voted significantly more 'yes' than MEPs belonging to anti-European parties and right parties. Moreover, MEPs from new Member States voted significantly more 'no' than MEPs from old Member States. We did not find a significant impact of individual characteristics of MEPs on their vote choice.

> ***Statement 4.*** *The voting behaviour of MEPs concerning CCCTB is significantly and positively influenced by the economic impact of CCCTB on their Member State.*

2 Practical implications

The three academic papers in this dissertation focus on some important issues related to the harmonization of the corporate tax base in Europe. Although it is a wide and complex topic, we are confident that this dissertation may offer some practical and political implications on which we will elaborate in what follows.

The EC proposes an optional CCCTB, which means that European companies would have the choice between either applying the new tax system or staying with their current tax system (EC, 2011). Companies behaving rationally will only opt into the new tax system if this results in an advantage in terms of taxes payable and/or compliance costs. In this respect, it is important (i) to reduce the tax planning opportunities for European multinationals and (ii) to minimize the compliance costs under the new tax system. These are also two objectives of the EC in the light of the design of the allocation formula (Agundez-Garcia, 2006). Given the results in our first paper we recommend policy makers to include more allocation factors into the formula and apply equal weights to the allocation factors in order to reduce tax planning opportunities . In addition, in the light of reducing the compliance costs for multinationals, factor definitions should be kept as simple as possible. Especially with respect to the factor 'sales by destination', we found that compliance cost could be high in comparison with defining the other allocation factors. However, including the more simply

defined ‘sales by origin’, or simplifying the ‘sales by destination’ by applying a pure throw back rule in case of no-where sales is, in our opinion, not the correct solution. Namely, by doing so, the balance between the supply and demand side of the profit generating factors would be disturbed. Therefore, we recommend policy makers to provide multinationals with a computer-based tool enabling them to define the sales by destination without great efforts.

The EC’s proposal for a CCCTB concerns a decision of direct taxation, which means that the consultation procedure is applied (Art. 115, TFEU). Following this procedure, the proposal should be adopted unanimously by the Council before it could be implemented into the Member States. The European Parliament plays a consultative role in this context. Focussing on the voting behaviour of the MEPs, our third paper provides some indications of which factors could play an important role in the voting behaviour of the Council members. Our research shows that the MEPs’ voting behaviour is influenced by party or country variables just as well as by the economic impact of CCCTB on their MS. Namely, our results show that MEPs are more likely to vote in favour of the proposal when the impact of CCCTB on the CIT revenue, on employment or on GDP for their Member State is higher. So, to increase the possibility of reaching a compromise in the Council, we could recommend policy makers to ensure that each Member State get the specific shares of the CTB they are entitled to, i.e. to provide a fair distribution of the CTB. In this respect, our second paper goes into more detail on the impact of CCCTB on the CIT-revenue for each Member State. In the case of Belgium, our results show that intangible assets should be included into the apportionment formula to obtain a fair distribution of the CTB. Therefore, we recommend Belgian policymakers to negotiate a full inclusion of the factor intangible assets.

3 Limitations and avenues for further research

Notwithstanding the academic contributions of our studies, we have to acknowledge that they suffer some shortcomings. This section describes the general limitations of each paper. These limitations form the base for avenues for further research.

The main shortcoming of our first study, concerning several designs of the apportionment formula, regards the limitation to generalize the results. The simulations carried out in this paper are based on the company specific data of one listed multinational. This gave us the

opportunity to make use of unpublished data which enabled us to study the different allocation factors in detail. Nevertheless, this strength is also a weakness, as it implies that our results can not readily be generalized. The results concerning the number of factors, and the weights given to each factor can be generalized, because they are not influenced by the company's specific data or structure. However, the results concerning the simplification of factor definitions are not as easily generalized. Namely, the effects of simplifying the factor definitions on the distribution of the CTB, actually does depend on the company's structure and data. As minimizing the compliance costs for European companies is one of the main advantages of the CCCTB, studies on a larger scale concerning the compliance costs are definitely needed. Also the overall effect of applying the apportionment formula instead of separate accounting, cannot be generalized. For our case, under separate accounting, almost all taxes are paid in the Belgian headquarters, applying the highest tax rate of the group. Whereas, under apportionment formula, the CTB would be spread among the different MS, lowering the overall taxes payable for the group. This effect would probably not be the same for every European multinational. Further research should be undertaken to confirm our findings on a larger scale.

The second study suffers from a generally known limitation, namely the unavailability of tax data. Given the confidentiality of this data, we had to rely on the profit/loss before taxation from the financial statements as a proxy for corporate taxable profits. Another shortcoming of this study is that we included only the capitalized intangible assets, whereas some intangible assets could also be expensed. However, we found a positive and significant impact of capitalized intangible assets on corporate profit. This finding corroborates our expectation that intangible assets are important in explaining the variation of profit and therefore, should be included into the allocation formula. Including also unrecognized intangibles could possibly strengthen this finding. To proxy for unrecognized intangibles, some researchers suggest the difference between a company's market value and its book value (Lev, 2007; Whitwell et al., 2007). As there are too few listed companies (N=50) in our sample, we were not able to use this proxy. Nevertheless, this would be an interesting avenue for further research. Also, extending this research to other European countries would be interesting. Finally, additional research should be directed towards practical solutions for valuing and locating intangibles.

In our third research we measure the economic impact of CCCTB by using the study of Bettendorf et al. (2009). Investigating the relation between the economic effect of CCCTB and the voting behaviour of MEPs, one could question whether the MEPs actually gathered information from this study. As we state in our paper, we consider the predicted economic impacts of the Bettendorf study to be well correlated with the basic features of the economy and the taxation system. As MEPs have a better knowledge of these basic features, this is what is really captured by the variables taken into account. However, an avenue for further research could be to investigate the MEP's voting behaviour based on questionnaires. This would also solve the problem that we now needed to assume the MEPs' personal ideological beliefs to correspond with those of their party, which is not always the case (Hix, 2002). Another shortcoming is related to the fact that the MEPs voted on the amended proposal. One important amendment is made to the apportionment formula. Namely, the EP suggests the weights for the factors sales, employment and capital to be 10, 45 and 45% respectively, whereas the Bettendorf study is based on equal weights. Finally, we were not able to investigate the voting behaviour concerning the individual amendments as these data are not available. However, this would be an interesting topic for further research. Especially, in the context of an enhanced cooperation it would be very interesting to study the position of those countries that are willing to cooperate.

4 CCCTB: an infeasible pursuit?

"The elevator to success is out of order. You will have to use the stairs … one step at the time"

-Joe Girard-

As pointed out throughout this dissertation, the implementation of a Common Consolidated Corporate Tax Base (CCCTB) would introduce some significant benefits. Not only would it ease the tax compliance for EU multinationals, it would also deal with aggressive tax planning in Europe. However, the need for an unanimous approval in the Council seems to impede the further development of CCCTB. Since its release in March 2011, there has been little or no progress towards the implementation of the CCCTB directive. Several member states, especially some smaller and less EU-minded Member States, find it hard to allow the

European Commission (EC) to interfere with their tax systems (Van Brantegem, L.[72], 2015). After four years of technical discussions within the Council, one could state that the CCCTB proposal is too ambitious to be adopted at once (EC, 2015).

Nevertheless, the political debate following LuxLeaks stressed again the importance to tackle the inefficiencies of the corporate tax systems in Europe. As an answer to the current lack of coordination in corporate taxation between member states, the EC published an action plan for a fair and efficient corporate tax system in the European Union (EC, 2015). One of the five action areas is the re-launch of the CCCTB, implying that the Commission aims to come forward with a new proposal in 2016 to revive the CCCTB. In their attempt to maximise the chance of adoption by the member states, the Commission will take into account the discussions within the Council of the past four years. The new proposal would include (i) *a mandatory* (at least for multinationals) CCCTB, which should be implemented through (ii) *a step-by-step approach* (EC, 2015). In what follows we will elaborate on those two main changes.

An optional system, as originally proposed, would not only mean introducing a 29th tax system, it would also allow cherry picking for multinationals, i.e. multinationals will choose that system under which they pay the lowest taxes. From this point of view, a mandatory system could be justified. However, it could complicate the negotiations within the Council, given the reluctance of member states to give up their fiscal autonomy. Asking the Minister of Finance for Belgium, Johan Van Overtveldt, about his position towards CCCTB, he expressed his concern to keep fiscal sovereignty as an economic policy instrument (Parliamentary questions, 2015).

The step-by-step approach would make it easier for member states to agree on the new tax system. In a first step, consolidation and reapportionment would be ignored, as those aspects proved to be the most controversial ones during the negotiations (Van Brantegem, L., 2015). This could indeed lead to a more feasible option. But then again, we cannot lose sight of the fact that consolidation brings forth some main advantages for EU multinationals, viz cross border loss compensations and the elimination of transfer pricing systems. To compensate the lack of consolidation, the EC proposes that a parent company would receive

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a temporary cross border tax relief for the losses of a subsidiary (EC, 2005). In a second step the consolidation aspect would be introduced. However, as it still concerns tax issues, all steps need an unanimous approval from the Council to be implemented. Some member states, e.g. the UK, already expressed their aversion towards a complete harmonisation of the tax system in Europe (Van Brantegem, L., 2015). Therefore, one could reasonably doubt whether the consolidation and reapportionment will ever become reality. A more feasible thought could be that the step-by-step approach will go no further than the CCTB, with potentially a temporary cross border loss offset.

As it seems unlikely that all member states will join the CCCTB, albeit through the application of a step-by-step approach, another alternative in the EU Treaty could be to adopt the proposal via an enhanced cooperation[73]. However, Margrethe Vestager (Commissioner for Competition) already mentioned that this would not be a good idea as this "might scare member states away and because competition is important for all EU member states" (EP, 2015).

It is clear that the original CCCTB proposal is too ambitious to be implemented at once but also that the current tax rules do no longer fit the globalized European context. The current public attention towards tax avoidance and the political pressure for more tax transparency makes clear that corporate tax harmonization in Europe is much needed. Only time will tell how far we can go as one European Union in harmonizing the corporate tax systems.

[73] An enhanced cooperation implies the adaptation of CCCTB by at least nine member states. Regulations on enhanced cooperation are outlined in Article 20 of the Treaty of the European Union.

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